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48 **Special Rig Cuts Cost of Deck Work** — platform used below bridge

114 **Paving Train Meets Spex for Jet-base Runway** — heavy load design

124 **Dozer and Belt Load Shot Rock** — trucks load in half a minute

Story:
slab for
pipeline
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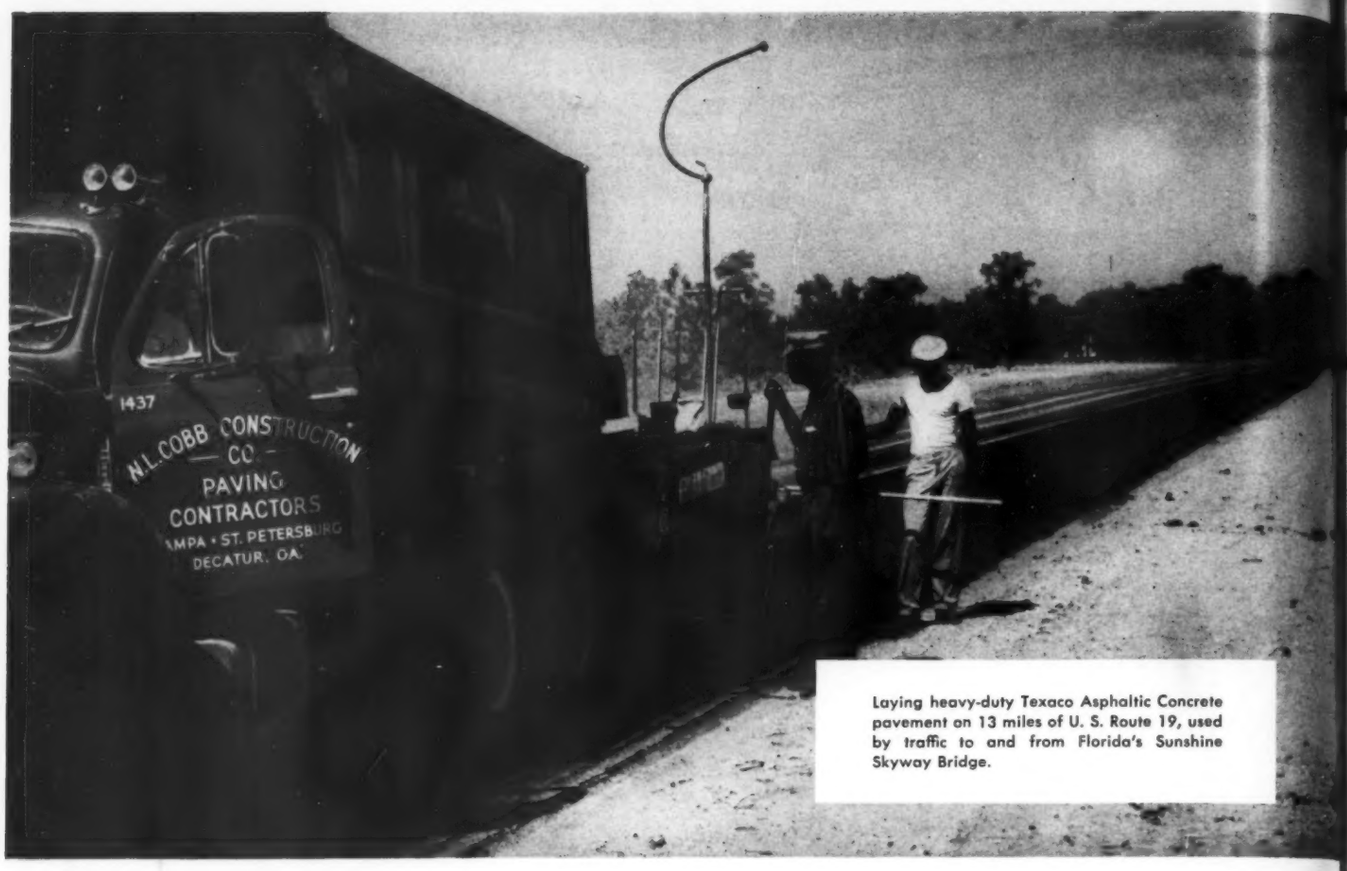
ONTRACTORS and ENGINEERS

A Gottesman Publication

AZINE OF MODERN CONSTRUCTION MARCH 1960



Laying heavy-duty Texaco Asphaltic Concrete pavement on 13 miles of U. S. Route 19, used by traffic to and from Florida's Sunshine Skyway Bridge.

Florida converts inadequate road into a dual Asphalt highway

When Florida built the new Sunshine Skyway Bridge over Tampa Bay, U. S. Route 19 in Pinellas County could not cope with traffic to and from the bridge. The State remedied this by converting the old 24-foot road into a modern, divided Asphalt highway.

A new 24-foot lane was constructed for northbound traffic. Its heavy-duty surface of hot-mix Texaco Asphaltic Concrete was laid on an 8½-inch limerock foundation, over a 12-inch stabilized subgrade. Hot-mix Texaco Asphaltic Concrete also was used to resurface the existing road, which now serves southbound traffic.

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CONTRACTORS and ENGINEERS

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Forming reduces school labor cost. Page 10

Grading spread makes up time. Page 86

Lower deck, George Washington Bridge. Page 94

COVER:

A Koehring 34-E paver supplies concrete for the base of a trench that will enclose a triple 78-inch water line for the city of St. Louis, Mo. A screed pulled by a tractor with side boom strikes off the mix. After the three steel pipelines are laid on the reinforced slab, they will be encased in concrete. Page 36

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An index of articles published in *CONTRACTORS AND ENGINEERS* during 1959 is available on request.

Editorial

Keep competition healthy

Some very sound advice to the construction industry was uttered at the recent 41st annual meeting of the Associated Equipment Distributors in Chicago. Outgoing president F. J. Fitzpatrick of the Parker-Danner Co., a Hyde Park, Mass., distributor of construction machinery, warned that contractors are bidding much too low for the work they are undertaking.

The week before in Cincinnati, at the annual convention of the American Road Builders' Association, several contractors were privately voicing concern at a growing trend, particularly by newcomers in the contracting business, to cut bid prices drastically in order to get a job. As a result of such price cutting, long established and reputable contractors are going without work while their plants, equipment, and personnel are idle. The jobs are going to many neophytes in the business who may be operating on the proverbial shoestring.

As one contractor put it, a shovel runner gets the idea he no longer wants to work on a salary and decides to go into the contracting business on his own. He then enlists the financial backing of, say, his doctor, lawyer, or neighborhood merchant. With his own savings and the money raised from his backers he goes shopping for equipment so that he can bid on jobs that are to be awarded. He buys the equipment with very little cash and a lot of credit, then underbids everybody else in order to make sure he gets the work to pay for his newly acquired machines. All this sounds like the ambitious drive of any eager-beaver equipment operator who aspires to be his own boss. The construction industry is full of such cases where a shovel runner may rise to head his own million-dollar contracting firm.

Self-betterment is not attained, however, when the new contractor fails to meet his financial obligations, realizes he cannot do the work for the price he bids, and ends up broke. Nor is the more experienced contractor any better off as he sits idly around with no work to do while others recklessly undercut his bid at prices he knows are unrealistic and foolhardy.

But Fitzpatrick had words of admonition for others than contractors with their cutthroat competition. He scored distributors for their fault in overselling the small contractor. He also urged them to educate the newcomer into the field as to the type and amount of equipment best suited to do his work economically as well as efficiently. The former AED head contended that the distribution of construction machinery must be a well organized and disciplined industry, and not one that emphasizes selling above everything else at the expense of responsible service.

President-elect John A. Volpe of The Associated General Contractors of America also addressed the AED, calling attention to the trend of more people getting into both the general contracting business and the construction-machinery business. Volpe, former Federal Highway Administrator, heads his own construction firm in Malden, Mass. In assessing the present state of the construction industry, Volpe stated, "The problem at the moment appears to be the fact that too many persons, not qualified, are able to obtain easy credit and become unhealthy competition. The contractor and the equipment man pay their bills on time, know their business, and do a job they can be proud of, and then are hurt by the fringe operator who comes into the industry with little or no knowledge and takes advantage of the easy credit. He eventually will drop along the wayside in bankruptcy, which somebody pays for, and I am sure it is you and I."

Construction is one industry where there is little chance for any monopolies to exist. That is good, for free enterprise flourishes when competition is keen. Competition insures that the private owner or government agency, through awards to the low bidder, is getting its work done as economically as possible. But no contractor can be expected to do a good job when he is harassed by creditors, unpaid bills, or an approaching sheriff. Competition must be on a sound and healthy basis for the construction industry to prosper as it should.

CONTRACTORS and ENGINEERS

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1960 Road Funds

Spending for highway, road, and street construction will hold at near record levels in 1960, according to a new Bureau of Public Roads estimate.

Government at all levels will spend a total of 6.683* billion dollars this year—5.641 billion for actual construction and another 1.042 billion to buy up right-of-way and to meet preliminary engineering costs.

The BPR predictions for 1960 are 1.3 per cent below 1959 total capital outlays of 6.769 billion dollars and 2.4 per cent below last year's expenditures for construction.

Three-fourths of the 5.780 billion dollars spent for actual construction in 1959 was used on the federal-aid system. Interstate highways took 33 per cent of the total, and the other federal-aid primary and secondary roads (the ABC system) accounted for another 42 per cent.

The 1960 interstate construction expenditures—estimated at 1.875 billion dollars—will be roughly the same as last year's investment of 1.887 billion.

But spending for primary and secondary road construction will drop 11 per cent—back to the 1957 level—although there has been no cutback in the federal-aid apportionment for the ABC system. The principal reason for the decline is that construction financed with the extra anti-recession "D" funds authorized in 1958 is nearly completed, and it will not swell 1960 spending totals as it did in 1958 and 1959.

Increased 1960 spending on non-federal-aid systems is not expected to be sufficient to offset the decline on ABC roads.

Expenditures for local roads and streets will rise 5.4 per cent over 1959 to 1.357 billion dollars. About 260 million dollars will go into construction of state roads not part of the federal-aid system. This is 34.7 per cent above the 1959 figure.

With these added expenditures, the non-federal-aid systems will increase their share of total 1960 construction funds to 29 per cent. The federal-aid systems will take a 71 per cent share —4 per cent less than in 1959.

Outlays for maintenance are expected to increase from 2.387 billion dollars in 1959 to 2.469 billion in 1960. States will spend 992 million dollars of this, local rural governments will account for 856 million dollars, and municipalities will expend 601 million dollars on street maintenance.

Including miscellaneous costs—administration, research, highway, police, interest on debt, and debt retirement—the grand total spent for highway purposes in 1960 is expected to reach 11 billion dollars.

** All figures are 48-state totals. The new states, Alaska and Hawaii, together with Puerto Rico, accounted for 33 million dollars of total capital outlay in 1959, and will add 34 million dollars to total highway spending in 1960.*

Estimated Capital Expenditures for Highways, 1958-1960, by Federal Systems, by Expending Agencies, with Net Construction Component

(In millions of dollars)

EXPENDING AGENCIES	INTERSTATE SYSTEM		OTHER ABC SYSTEMS		OTHER STATE ROADS		OTHER LOCAL ROADS AND STREETS		ALL SYSTEMS	
	TOTAL	NET CONSTRUCTION	TOTAL	NET CONSTRUCTION	TOTAL	NET CONSTRUCTION	TOTAL	NET CONSTRUCTION	TOTAL	NET CONSTRUCTION
1958										
State Highway Departments	1,596	1,141	2,692	2,362	267	215	63	61	4,618	3,779
State Toll Facilities	415	403	54	53	31	31	-	-	500	487
Local Toll Facilities	47	40	5	5	-	-	17	16	69	61
Local Rural Governments	-	-	54	49	-	-	478	435	532	484
Municipalities	-	-	39	35	-	-	560	506	599	541
Federal Agencies	-	-	-	-	-	-	137	137	137	137
Total	2,058	1,584	2,774	2,504	298	246	1,255	1,175	6,385	5,509
1959										
State Highway Departments	2,147	1,697	2,615	2,293	248	184	94	91	5,104	4,265
State Toll Facilities	189	184	19	19	12	12	-	-	220	215
Local Toll Facilities	60	46	6	6	-	-	15	14	81	66
Local Rural Governments	-	-	56	51	-	-	484	440	540	491
Municipalities	-	-	46	41	-	-	598	562	644	603
Federal Agencies	-	-	-	-	-	-	180	180	180	180
Total	2,396	1,887	2,742	2,410	260	196	1,371	1,287	6,769	5,780
1960										
State Highway Departments	2,350	1,796	2,897	2,000	260	235	97	94	5,604	4,089
State Toll Facilities	30	29	39	39	29	29	-	-	118	117
Local Toll Facilities	80	70	6	6	-	-	15	14	101	90
Local Rural Governments	-	-	57	51	-	-	899	855	956	906
Municipalities	-	-	55	49	-	-	648	613	703	662
Federal Agencies	-	-	-	-	-	-	181	181	181	181
Total	2,480	1,895	3,054	2,145	309	264	1,440	1,337	6,683	5,641

1/ Exclusive of right-of-way and preliminary engineering costs. Source: Bureau of Public Roads

PROFIT

Great new Goodyear tread cuts tire costs!

ON NEW SUPER ROAD LUG—a tougher tread utilizing advanced super-toughening agents mated to the toughest body known! This recently perfected tread compound matches the ruggedness of 3-T (nylon or rayon) Processed Cord! Result: an outstanding example of Goodyear's *toughest tires on earth!*

Now longer wear can reduce tire costs to build your profit. The bigger the job, the more you'll save with SUPER ROAD LUG on your wheels.

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Surveying Washington

by E. E. Halmos, Jr.

The calm before the storm

Washington—and particularly Capitol Hill—can be a deceptive place.

You've read all the predictions of furious Congressional activity, in view of plans for a short session, and a lot of political battling. Yet it was possible on a mid-February day, to walk into the impressive chambers of the U. S. Senate and find only three senators present: one presiding, one making an impassioned address concerning the poll tax, and the third buried deep in some voluminous reports. The only other occupants of the chamber were the ever-present page boys, clerks, and reporters for the *Congressional Record*.

What you didn't see was the vast activity elsewhere on the Hill that would finally come to a head in this chamber. On that day, for example, more than 32 committee meetings were going on, at which testimony was being taken and questions asked that would shape future legislation.

As of mid-February, many of these committee sessions had not approached major matters of concern to the construction industry. The apparent strategy of the Congressional leadership was to allow any controversial measures, such as Civil Rights, to come up and be disposed of before the session got down to business.

Watch AFL-CIO conference

The AFL-CIO's Building Trades Department sixth annual Legislative Conference, March 14 to 17, may have more effect than usual in view of the facts of political life this year. The conference really consists of several thousand union members deploying themselves over Capitol Hill to ask for face-to-face answers from congressmen on union legislative demands.

The particular target this year is an amendment of the Taft-Hartley Act to eliminate application of the famous Denver Buildings Trades Rule, set out in a 1951 Supreme Court decision that permits union and non-union men to work on the same job. Other objectives include broadening the scope of the Davis-Bacon Act; passage of a comprehensive school-aid and construction bill and a comprehensive housing bill; and passage of a depressed-areas bill to assist chronic areas of unemployment by federal construction loans.

Construction vs. committees: score to date — a draw

Construction was getting in some licks and taking some lumps from Congressional committees. At one point, representatives of the American Institute of Architects, appearing before the House Subcommittee on Appropriations, were objecting vigorously to rulings of the Bureau of Indian Affairs which have had the effect of canceling all contracts for private architectural services for the past year.

AIA was thus jumping in, a little to one side, in a growing battle that so far is aimed at consulting engineers in the highway program but seems to be spreading rapidly to other governmental construction areas. The crux of the fight is charges by the General Accounting Office that fee-contracts to professionals are "open invitations" to overdesign and so increase fees.

Before the Senate Committee on Interior and Insular Affairs, proponents of a new conservation policy (S 2549) were arguing that the federal, state, and local governments should get together to coordinate plans for conservation construction. This includes the requirement that the President should deliver an annual "state of natural resources" message and have a 3-man advisory commission to assist him in this matter.

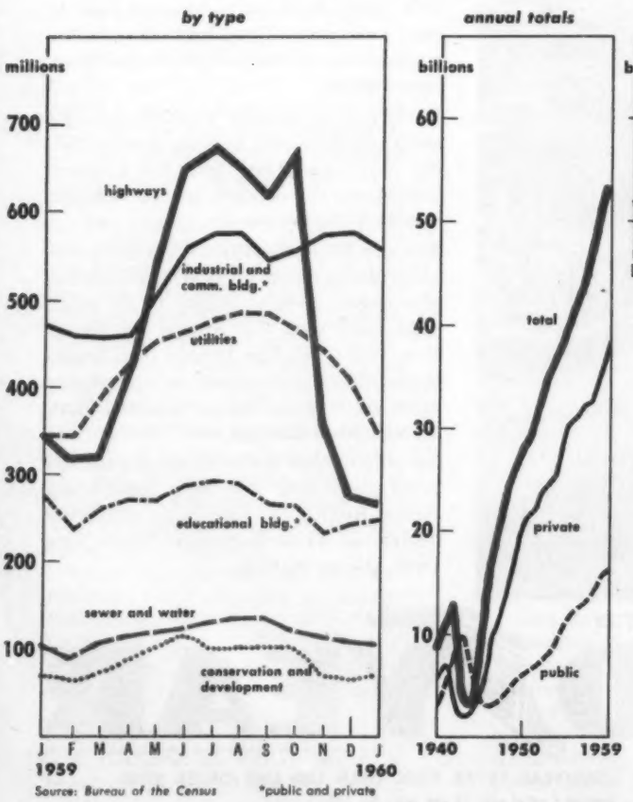
Another House committee was listening to somewhat lukewarm arguments favoring further aid to housing, through pumping another $1 billion of credit into the resources of the Federal National Mortgage Association. Housing groups themselves look on it as a last resort.

Before other committees, Army engineers, Reclamation chiefs, and other government construction-agency officials were beginning their annual efforts to defend budgeted appropriations or seek more funds. At least one investigative group, Rep. Blatnik's special public-works subcommittee, had also started asking official questions about the conduct of the highway program.

Industry Trends

DOLLAR VALUE OF NEW CONSTRUCTION

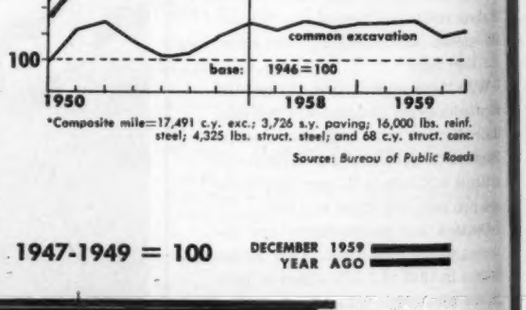
Recent Monthly Trends



Source: Bureau of the Census *public and private

AVERAGE BID PRICES

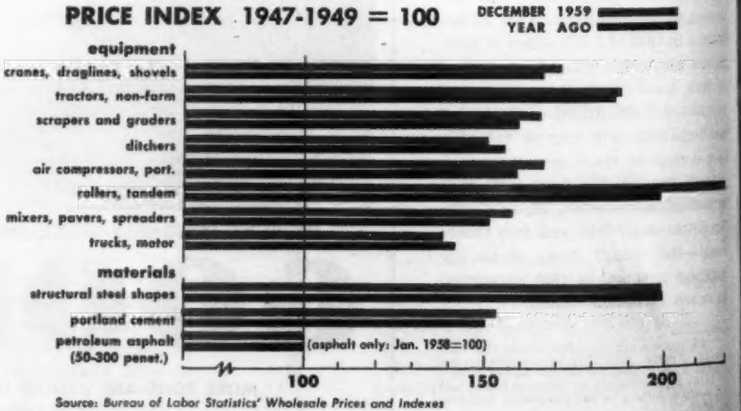
Federal Aid Highway Construction



*Composite mile=17,491 c.y. exc.; 3,726 s.y. paving; 16,000 lbs. reinf. steel; 4,325 lbs. struct. steel; and 68 c.y. struct. conc.

Source: Bureau of Public Roads

PRICE INDEX 1947-1949 = 100



Source: Bureau of Labor Statistics' Wholesale Prices and Indexes

Tough going for aid to school construction

School-construction aid programs are having rough sledding so far, in this Congress. Early in February, for instance, the Senate voted down proposals for a $25-per-pupil grant to schools for construction and other purposes; a scheme to divert $235 million of cigarette-tax money to school aid; and a plan for a $2.9 billion federal program (over 30 years) for construction purposes. But then, senators did pass (by a tight and strictly political vote) a third bill, which would provide $1.8 billion in federal money over two years, for construction and teachers' salaries. House committee changes—possibly knocking out the salary provisions—were considered inevitable.

Nevertheless, new measures were being put into the hopper. A late one was Senator Fullbright's proposal that Housing and Home Finance Agency get an increase of $500 million in its borrowing authority for loans to colleges and universities for student and faculty housing and other purposes.

You will recall that the Administration is flatly opposed to the whole idea. President Eisenhower's budget message, in fact, asked only that the Commissioner of Education be granted authority to guarantee taxable bonds issued by the schools to pay for construction work.

Government suit brings back Dixon-Yates controversy

The famed Dixon-Yates controversy over providing power to Atomic Energy Commission plants near Paducah, Ky., popped back into the news when a new suit was filed in the Supreme Court.

The action was filed by the U. S. Government against the Mississippi Valley Generating Co., on its own behalf and that of 24 other organizations and individuals. Lower courts had said the company was entitled to recover "termination costs and damages" under terms of the original contract it held. The government argues that the contract was invalid, since one of the participants, Adolphe H. Wenzell of the First Boston Corp., had violated conflict-of-interest laws by acting as a government consultant during negotiations with his own company.

Hebert bill takes aim at ex-military top staff

Although construction firms are not the principal target, watch the progress of HR 9682 if you have any ex-military people on your top-staff payroll and are looking for, or doing, work for the military.

The bill is authored by Rep. P. Edward Hebert (D., La.), whose House Armed Services Committee has long been annoyed by ex-military men getting lucrative jobs in private industry on the strength of their knowledge of government procedures and people. The meat of the bill is a definition of "selling." It would include "all activities which bring a contractor into contact with officials (of the Defense Department) for the purpose of obtaining contracts . . . for procurement of intangibles . . ." That, apparently, would include both engineering and contracting services.

Hebert makes no secret of the fact that he has taken dead aim at aircraft and missile manufacturers. But it is obvious that construction firms will also be affected.

Contractors to get big chunk of FAA's building program

Construction contractors will get a large portion of the $118.2 million that the Federal Aviation Agency will spend this year for major air navigation and control facilities throughout the country.

The program includes construction of 20 new airport control towers; 10 new air-route traffic-control centers; 8 long-range radar installations, costing an average of $2.4 million each; installation of approach lighting systems; and other work that will generally involve electronic equipment.

Urban highway costs

If you are looking for figures on construction costs, consider this one, produced by Carl E. Fritts, vice president in charge of engineering for the Automotive Safety Foundation: The national average cost of a mile of interstate highway in an urban area is $4 million; in Washington, it would be $6 million.

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1. Place your order for a parts exchange assembly that is available from dealer stock.
2. Remove your worn assembly and install the reconditioned unit.
3. Send your machine back to work and return the worn unit for credit.

Do-it-yourself repairs to parts assemblies must be weighed against earning losses. What would your equipment earn for you *during the extra time* it takes to repair parts assemblies? You can eliminate earning losses of this type and still pay no premium. Your equipment can actually be making money for you, when otherwise it would be down.

Cat assembly exchange units are guaranteed by your Caterpillar Dealer and can be ready to go on just as soon as the worn assembly is off. The cost? The cost compares favorably with the actual cost had you done the repair work yourself—often less because of the availability of special equipment and serviceman's skill in your dealer's shops.

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Any way you look at it, Cat Parts Assembly Exchange is a good deal. You get a dependable, guaranteed exchange unit at approximately the same cost had you done the job yourself—and the time saved can be converted into cash by having your machine working and earning. Contact your dealer today for his list of Parts Assembly Exchange Units and prices.

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EQUIPMENT RENTAL AVERAGES DURING 1958*
as compiled by Associated Equipment Distributors

CRAWLERS	PER DAY DIRECT DRIVE	PER DAY TORQUE CONVERTER
D9	$296.00	$386.00
D9 w/No. 9A Dozer	367.00	457.00
D9 w/No. 491 Scraper	497.00	507.00
D8	211.00	330.00
D8 w/No. 8A Dozer	270.75	398.25
D8 w/No. 463 Scraper	366.00	485.00
D7	142.00	
D7 w/No. 7A Dozer	188.25	
D7 w/No. 435 Scraper	265.00	
D6	107.00	
D6 w/No. 6A Dozer	148.50	
D6 w/No. 60 Scraper	179.75	
D4	74.75	
D4 w/No. 4A Dozer	109.50	
D4 w/No. 40 Scraper	113.40	

MOTOR GRADERS	PER DAY
No. 14	$138.00
No. 14 w/Scarifier Attach.	149.00
No. 12	117.00
No. 12 w/Scarifier Attach.	125.75
No. 112	93.00
No. 112 w/Scarifier Attach.	110.85
WHEEL TRACTORS w/2-WHEEL SCRAPER	
DW21-No. 470	$382.00
DW20-No. 456	482.00
DW15-No. 428	205.00
TRACTOR LOADERS, FRONT END LOAD and DUMP	
No. 977	$199.00
No. 955	108.00
No. 933	85.75

*Figures are national average rates and in no way reflect the going rate in any area, and cannot be so used. Actual rental costs vary depending on local practices and conditions.

SERVICE TIP

BEFORE you begin to tear down your equipment to remove a parts assembly, check with your Caterpillar Dealer on availability and delivery. The big advantage of Parts Assembly Exchange is in having the reconditioned unit ready to go on as soon as the worn one is off.

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For more facts, circle No. 253→

One-make paving rigs turn in good production

A Rex spreader, equipped with two rear-mounted vibrators that ride close to the forms, strikes off the mix to its final depth of 9 inches.

Another Rex machine—a double-screed transverse finisher—is third in line. A workman uses an electric vibrator for additional consolidation along the forms.

A concrete-paving spread of Rex equipment hits a good stride on a 5-mile stretch of the Hartford-Springfield Expressway near Enfield, Conn. Leading off the train is the Rex double-drum paver that places concrete, and then moves back to place additional mix after reinforcing has been set for the 12-foot lane.

Production of over 2,500 linear feet of 12-foot-wide, 9-inch-thick concrete pavement per 8½-hour day was average for the joint-venture firms of Enfield Road Construction Co., Inc., Thompsonville, Conn., and E. T. O'Neill & Son Construction Corp., Holyoke, Mass., on a 5-mile stretch of the Hartford-Springfield Expressway near Enfield.

The project, which includes six grade separations, was divided between the two joint-venture firms—Enfield doing the road work and paving while O'Neill built the structures.

Standard spread

To handle the paving of this $3,683,000 project, as well as another 1-mile contract stretch to the north, Enfield bought a complete concrete-paving package of Rex equipment from the Chain Belt Co., Milwaukee, Wis. This 100 per cent Rex spread, including the Rex batch plant, contains all the latest models produced by the company.

The paving train consists of a double-drum paver, an auger-type spreader equipped with rear-mounted electric vibrators, a double-screed transverse finisher, and a longitudinal floating machine.

The spreader generally made two passes—one to trim the mix being dumped so that the folded welded-wire reinforcing could be positioned, and one to trim additional concrete batches to the desired 9-inch thickness.

Enfield had about 10,000 linear feet of 9-inch forms on the job and always

LUBE LOGIC

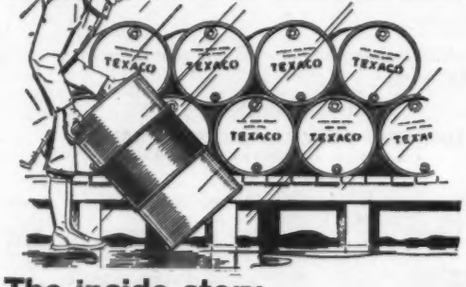
Six tips to

How high is your hidden cost of maintenance?

You may not realize how many extra maintenance dollars you spend when you keep many different lubricants on hand. (Six are often all you need to cover all major maintenance.) You pay extra for inventory. You pay extra for storage and handling. It costs you more in paperwork to order. And you'll have to figure the wasted cost of equipment parts and downtime if misapplication should occur.

The Texaco Lubrication Plan helps you reduce or eliminate these hidden costs. That's because it provides the minimum number of *proven* multi-purpose and special lubricants, tailored to your job requirements.

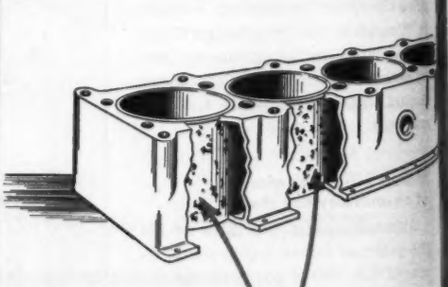
You'll do yourself a favor when you check with Texaco Lubrication Engineer. He'll carefully plan your lubrication needs—then follow them up to see that your lubrication problems are taken care of fast.



The inside story on outside storage

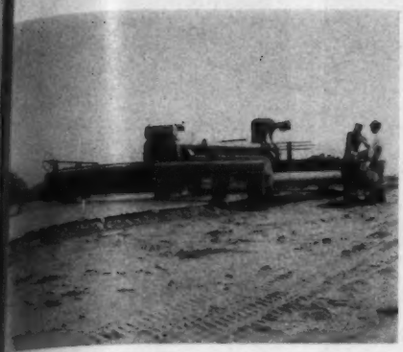
You're short-changing yourself if you skip these simple precautions: drums stored outdoors should be placed on their sides. When stored on end, expansion and contraction through temperature changes can suck in rain water that collects on top of the drum.

Want to warm up lubricants that have become stiff from cold? *Don't* heat them with an open flame. You might melt the sealing compounds, and the drum will leak. You might also damage the product with too much heat in one spot. Put the drum indoors for a while before using.



Here's how to handle cylinder cavitation erosion

High pressure cooling systems in use in most supercharged diesels are subject to coolant aeration. This aeration can cause cavitation, leading to serious cylinder liner corrosion-erosion, unless a rust preventive is added to the water. A good antifreeze (like Texaco PT antifreeze) will do the job in winter—but in summer a 1% to 2% solution of Texaco Soluble Oil will do a fine job. (Remember to flush out before you add antifreeze again.)



Bringing up the rear of the train is a Rex longitudinal floating machine that smooths out the ridges left by the transverse finisher.

A Manitowoc crane charges the Rex 3-compartment aggregate bin with material from the stockpiles.

had forms set 500 to 1,000 feet in front of the paver. These were set by driving form stakes with an air hammer powered by a Le Roi Tractair self-propelled compressor. The forms were stripped by removing the pins with a contractor-built and a standard pin puller about 24 hours after concrete placement. The concrete slab, however, was cured and kept covered with Sisalkraft paper for about 14 days.

Batch plant

The batch plant consisted of a 140-ton 3-compartment aggregate bin, charged by a Manitowoc crane, and an 850-barrel cement-storage silo. Cement was delivered to the plant site by Trailmobile 100-barrel tankers equipped with cement pump and pulled by White tractors.

Cement was transferred from the tankers by pumping through a 6-inch-diameter line running to the top of the silo. A flexible hose was used to connect the tanker to the silo's cement line. Enfield found this cement-loading system had many advantages. First, it eliminated the need for a man to be stationed at a conventional cement-loading hopper; in this operation, the truck operator made the hook-up between the tanker and silo. Another advantage was that cement loss was kept to a minimum because the entire system, from tanker to silo, was closed.

The new expressway, at present completed and opened to traffic between Hartford and the east bank of the Connecticut River, will shortly be completed all the way to Springfield, Mass.

Personnel

Anthony Guerriero was the superintendent; Francis Asquino, the paving superintendent; Pat Liucci, the master mechanic; and Steve Dellaquila, the project engineer for Enfield Road Construction. Les Johnson is the chief inspector and Rudy Gisselbrecht the resident engineer for the Connecticut State Highway Department. THE END

Two Tennessee offices of Corps to be merged

■ The Tullahoma and Nashville, Tenn., districts of the U. S. Army Corps of Engineers will be merged on July 1. The Tullahoma District was established in November, 1949, as a special office of the Corps tailored to supervise construction at Arnold Engineering Development Center for the Air Force.

The construction of AEDC's unique laboratories has involved the development of the world's largest axial-flow compressors, the only known 9-stage compressor system delivering a continuous supply of 4,000-psi air, and including complex electronic automation in every conceivable application.

Now that the center's original concept is nearing reality and the dollar volume of annual construction has diminished, the reorganization of the Tullahoma District into the Tullahoma area office, under the Nashville District, has been decided upon as the most economically feasible means for performing future construction.

cut maintenance costs

OIL GAUGES SPEAK A LANGUAGE ALL THEIR OWN

Look to your oil gauge pressure for clues to a variety of potential engine ailments. For example:

LOW OR NONE
1. Oil pump pickup stuck high.

LOW
1. Clogged oil pump screen.
2. Excessive main, con-rod, camshaft or rocker-arm bearing clearances.
3. Clogged full-low filter, if by-pass isn't working.
4. Excessive dilution of oil with fuel.
5. Enlarged squirt holes.
6. Loose connections or cracks in oil line.

LOW OR ERRATIC
1. Faulty oil pump.
2. Restriction in oil pan, or oil too viscous to keep oil pump intake supplied.

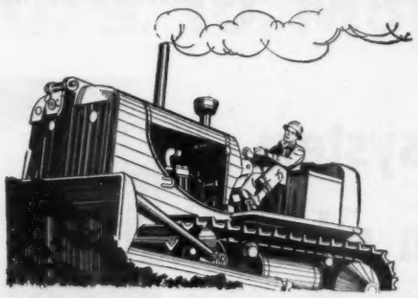
LOW OR HIGH
1. Faulty gauge.
2. Ineffective oil cooler depending on type, may keep oil too cold or provide insufficient cooling.

HIGH
1. Oil with viscosity too high for climate.
2. Sludge and contamination in the oil.
3. Clogged oil passages on the pressure side.

HIGH, LOW OR ERRATIC
1. Improper setting or failure of pressure relief valve.

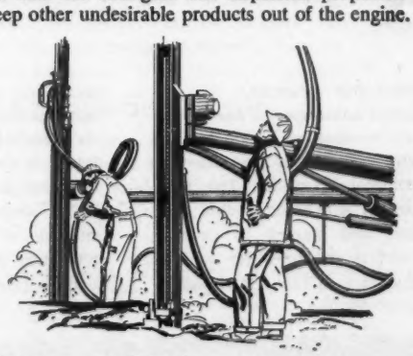
ERRATIC, LOW, THEN NONE
1. Crankcase oil level just at or below oil pump pickup.

NO MOVEMENT OR DELAYED ACTION
1. Clogged line to gauge.



Don't let engines foul up!

If the fuel injector on a diesel drifts off or "dribbles," incompletely burned fuel will contaminate the crankcase. The result will be plenty of smoke—and probably engine trouble. The injector should be fixed immediately—but if it can't be, start shortening drain periods to remove the damaging oil-fuel mixture. Also, use an oil with full detergent and dispersion properties to keep other undesirable products out of the engine.



New product for rock drill couplings

Actually, it's an old friend, Marfak Heavy Duty #2, in a new application. According to the raves from customers who've tried it, the lubricant works better on rock drill couplings than anything they've ever used.

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N.Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

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Canada • Latin America • West Africa

For more facts, use Request Card at page 18 and circle No. 254

Fast forming with the Acrow V-Form system cut labor costs on the Abraham Lincoln school, Denver, Colo. After a 6×4 support beam is in place on Acrow shores, form panels for a floor are set; pins on beams match holes in the channel frames of the panels.

Using Acrow adjustable beam clamps, supported on Acrow shores, crews form a beam bottom made up of V-Form panels. The illustration above shows the beam bottom looking down from the outside.

A workman on the underside turns the adjusting nut that moves the vertical brackets. The cross bracing also supports the scaffold.

Positive forming system simplifies work on school

Accurate and automatic alignment of forming system saves manpower on erection and stripping crews

by RALPH MONSON, field editor

Slotted wale members tie the shores together to increase rigidity and resist side movement. Special hooks and clips attach members to shores and each other.

The Acrow adjustable steel shores support forming for an upper deck. Here a section of the deck has been completed and forming stripped.

Fast, accurate, and positive forming with a minimum of manpower was the key to the smooth and rapid construction of the Abraham Lincoln Senior High School building in Denver. A. A. & E. B. Jones Co., Denver, holder of the $3.8 million general contract, used the Acrow V-Form system in forming for the multistory concrete-frame structure.

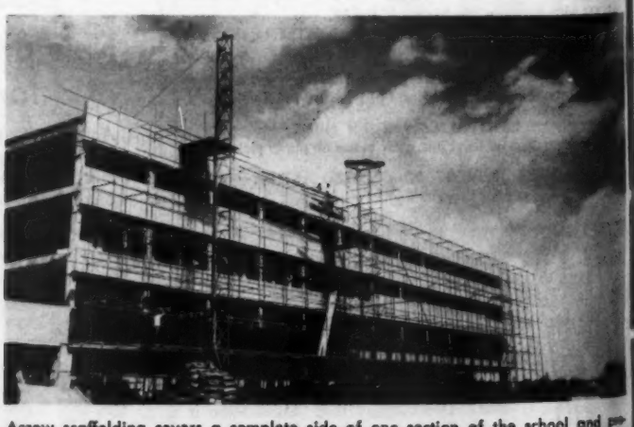
Separate contracts for the electrical and mechanical work brought the total cost of the new school to approximately $5 million. The structure, which will accommodate 2,500 students, was started in October, 1958, and is scheduled for completion this July, in time for the opening of the fall school term. The design and supervision of construction are handled for the Denver Public School System by Buell & Co., Architects and Engineers, Denver.

The simple, logical, step-by-step assembly of the V-Forms, together with their positive locking features, made it possible to reduce the labor costs for erection and stripping to a fraction of conventional forming costs.

Forming for slabs

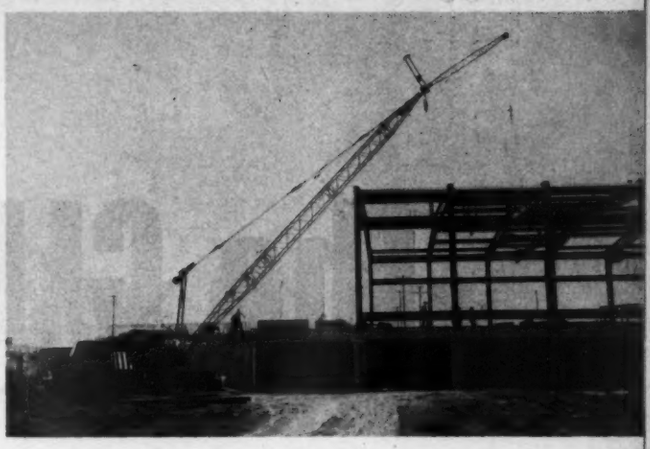
The typical floor in the multistory classroom section was a 14½-inch slab with 12-inch lightweight cinder-block cores. To form one of these

Concrete placement for the sloping floor of the auditorium section is handled by Prime Mover buggies. A Dart vibrator works the mix down around the reinforcing.



Acrow scaffolding covers a complete side of one section of the school and provides access with a minimum of cross bracing.

◄ In the classroom wing of the building, floor slabs are flat slabs with lightweight cinder-block cores. The blocks are banded together with Acme steel strapping.



A Lorain crane sets steel for the gymnasium roof. Midwest Steel Co., Denver, supplied and erected the structural steel for the job. ►

slab sections, the workmen first set up Acrow adjustable steel shores in rows spaced 6 feet apart, with the shores spaced 8 feet apart in the rows. Each shore supported 48 square feet of slab. The men nailed the base plates of the shores to planks laid on the floor below.

Channel-shaped wale members were then attached at about the mid-point of the shores with special connectors. These wales tied the shores together and also supported the scaffold planks on which the workmen stood to erect the remainder of the form system.

Next, the lightweight 6-inch steel support beams were set. These beams are fitted with projecting tapered pins which fit into holes in the head-plates of the shores. The men simply set the beams on the shores. The pins automatically took care of the alignment and attachment.

When they had set a series of the beams, the men laid the V-Form panels on them. These panels consist of steel channel frames faced with ⅝-inch plywood. The tapered pins project both up and down from the beams, and the upper ones engage holes in the channel frames of the form panels. The panels used on these slabs were largely the 2×6-foot size. Units 3, 4, and 5 feet long were also available for filling in odd dimensions. When the form panels were in place, the slab form was complete.

Use special beam clamps

To form beams, crews usually set the shores closer together, but this depended on the weight of the beam to be supported. Adjustable beam clamps were set on top of the shores to support the beam bottoms and sides. As the beam bottoms and sides were set in place, one man turned a screw in the adjustable clamp that locked the forms in place. On some of the large beams, the V-Form panels were used for bottoms and sides. On smaller beams, plywood served these purposes.

The odd spaces around columns, stair wells, and other openings were filled with special filler channels and plywood to complete the deck form.

When this was done, the cinder blocks were raised to the second-floor level on a Kolman conveyor. They were arranged in the desired

(*Continued on page 14*)

For more facts, circle No. 255→

Cat DW21-PR21 units handle rock "on the double" on U. S. 10, Montana

When Albert Lalonde Company, Sydney, Montana, was awarded a $1,537,337 contract on a four-mile section of U. S. 10 on the Interstate System, three Cat DW21 Tractors with Athey PR21 Rear Dump Wagons were purchased for hauling the rock. A. M. Stolzenburg, Superintendent, tells why: "We ran three seasons with them in rock jobs. Now that we're back in rock again, we bought some more. They're big, rugged and an easy shovel target, have a low center of gravity and are maneuverable."

Note how these features met the conditions on this job. The units had to work in limited room on benches and steep haul roads. Material handled for fill included shot rock and sandstone. On haul lengths averaging 300 yards, the units handled 275 cu. yd. an hour. At the start of the job, they worked 8 hours a day; to finish it, 16 hours a day.

New DW21 Series G now 345 HP

Now the DW21 Series G is matched to the 22.5 cu. yd. PR21 for even faster production on the toughest jobs. Compared with the model it replaced, it has new HP—345 (maximum output) for an increase of 8%. It also has 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, the horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics of the Cat Super-Turbo Engine.

Get the complete facts on the Cat DW21-PR21 from your Caterpillar Dealer. Ask for a demonstration. Pick a tough job—see for yourself how this giant handles the hard work!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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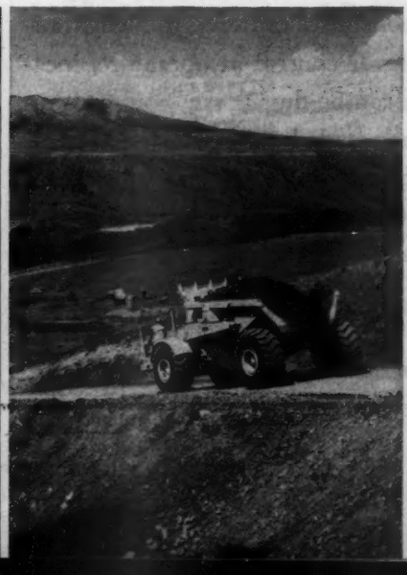
THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS

LOAD FAST! PR21 offers a big target. Short non-stop turns of DW21-PR21 unit speed spotting under shovel and work on a narrow bench. PR21's special steel withstands impact, abrasion and corrosion.

ROLL FAST! Two of three DW21-PR21 units on the job. DW21 combines high travel speed with excellent torque characteristics. The PR21 has a 22.5 cu. yd. heaped and 62,000 lb. capacity. All this adds up to fast cycles, top production.

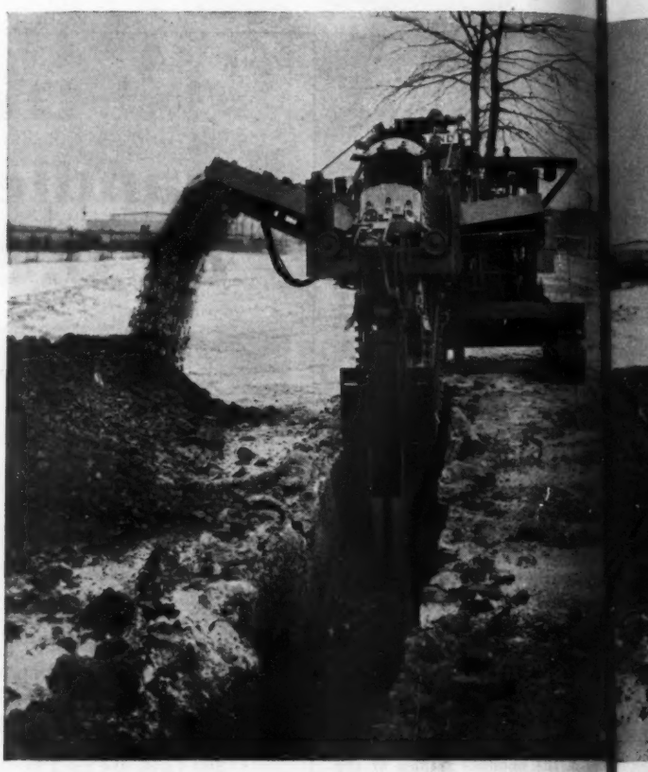


DUMP FAST! PR21 has hydraulic hoists for quick and complete dumping of any material. DW21's hydraulic steering facilitates maneuvering. Wide-section, tubeless tires provide maximum flotation and sure traction.

The CLEVELAND JS-3

WITH INSTANT LATERA

DIGGING WHEEL POWER-SHIFTS 5 FEET FROM SIDE TO SIDE



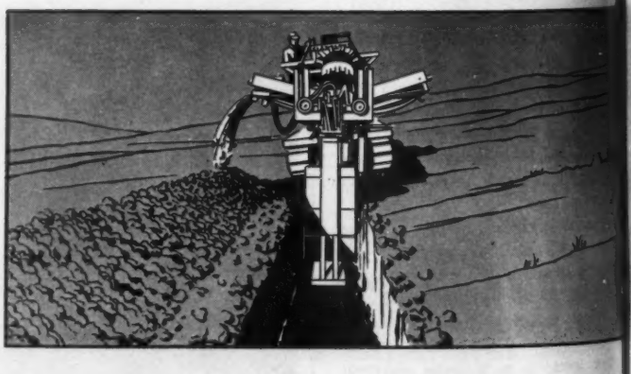
Digs trench behind either crawler or anywhere within its 6-foot width

Lateral shifting of the JS-30's wheel, up to 2½ feet to either side of center, is done hydraulically under lever control at operator's location, so trench can be dug at any point within 6-foot-wide path made by the crawler. Edge of 24-inch trench can be dug 5 inches outside either track, permitting trench to be flush with parallel pavement, curbs, sidewalks, etc. With wheel tilted, trench can be dug virtually flush with trees, poles, fences and other above-ground obstructions.

INSTANT DIGGING WHEEL TILT

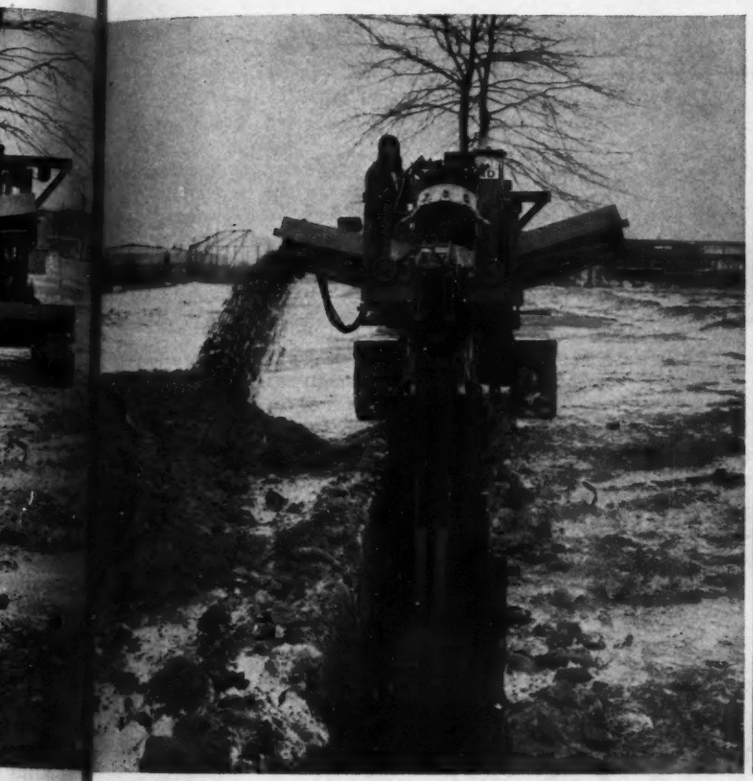
cuts blocking, cribbing costs

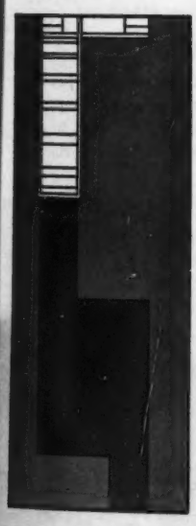
Hydraulic power-tilting of the JS-30's digging wheel to either side of vertical — a total tilting range of 14° — under lever control at the operator location, permits digging vertical trench on side slopes and in similar conditions with one crawler track on a higher level than the other. This eliminates the necessity of blocking, cribbing, etc. in such conditions. Power-tilt adds 7 inches to the outside cut of the digging wheel. This in combination with lateral power-shift permits digging trench virtually flush with above-ground obstructions.



-3 -a trencher of amazing utility

ERA DIGGING WHEEL POSITIONING





EXCAVATES BELLHOLES saves on trench width

Power-shifting and power-tilting of the JS-30's digging wheel are especially valuable in cutting trench to extra width required at pipe joints.. This permits digging trench to narrow width except where bellholes are required. By utilizing power-shift the JS-30 can dig up to 6 ft. wide, down to 5½ ft. deep — reduces slower hoe-work to clean-up, etc.

PLUS THESE OUTSTANDING CLEVELAND FEATURES

- *Every* operation is automatic, completely controlled at operator seat.
- Hydraulic crumbing shoe raised and lowered under lever control from operator seat.
- Automatic conveyor shifting for side-to-side positioning.
- V conveyor for faster, higher, more efficient spoil discharge.
- Pulley-enclosed, dual conveyor drives, with instant belt speed and direction control.
- 33 positive non-slipping digging speed-and-power combinations.
- World's finest trencher crawlers, 1000-hour-lubricated.

DIGGING CAPACITY: 5 ranges, from 11" to 24" wide, to 5½' deep; to 6' wide with power-shift.

POWER: 370 cu. in. diesel—59 HP @ 1250 RPM.

WIDTH: 6' over crawlers; 7' 11" over conveyor.

HEIGHT: 8' 2" digging; 9' 5" roading.

LENGTH: 27' 3".

Pioneer of the Modern Trencher ®

The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue • Cleveland 17, Ohio

For more facts, use Request Card at page 18 and circle No. 256

A sloping area under part of the auditorium presented some unusual forming problems that were solved with the V-Form system. The beams on both sides of this section are shored with Acrow shores and support beams. The beam bottoms are V-Form panels, and the beam sides have special slotted wales.

(Continued from page 11)

pattern to form the cores and strapped together with Acme steel strapping. On floors above the second, the blocks and other materials were raised on Clyde and Buck tower hoists.

After reinforcing bars were placed in the joist sections and a welded-wire reinforcing was set over the blocks for the 2½-inch slab, concrete was placed. Ready-mix concrete, supplied by Walt Flanagan & Co., was hoisted to a 2-yard double-gate hopper on the deck. Hand or power buggies delivered the mix from the hopper to the forms.

Stripping is simplified

The job of stripping the V-Form was simple and safe. As soon as the deck concrete had set, the wale members were removed from the shores and re-used in other areas. When the concrete had attained sufficient strength, a crew of three men stripped the forms.

One man lowered the adjustable shores by simply turning the adjusting screw, while the other two men picked out the support beams. The V-Form panels were held securely to the concrete deck by anchor hooks that had been inserted before the panels were set.

The stripping crew loosened the wing nuts on the anchor hooks and lowered the form panels one at a time. They stacked the panels on pallets for convenient handling by a Scoopmobile fork truck. The Scoopmobile moved stacks of panels from place to place as needed; it even hoisted them to the second-floor level.

Other forming

All concrete walls in the structure were formed with the V-Form panels supported by the same type of wales used on the shores. Walls were tied through with snap ties.

A special section called an external corner member proved especially useful in forming columns, as well as forming the edges of beams and slabs. These corner members locked right into the other units of the V-Form system with the same type of tapered pin and hole connections.

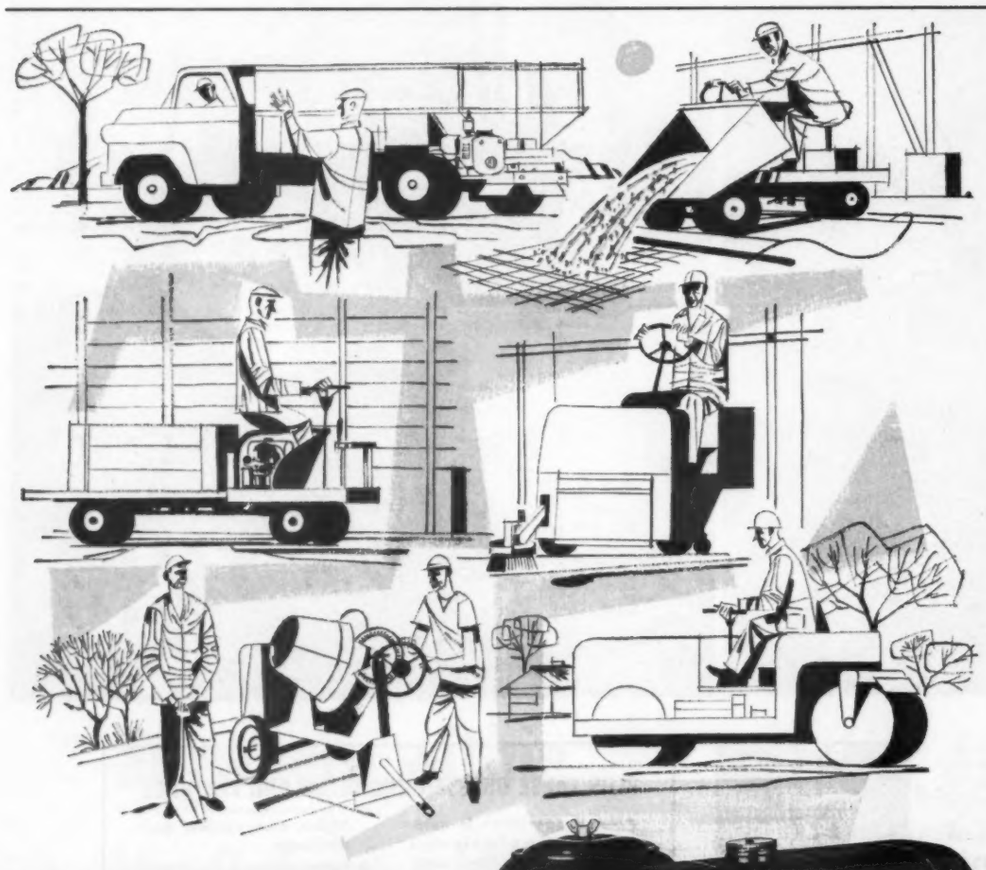
Some unusual forming problems were encountered in the sloping floor of the auditorium wing. Here, in addition to the usual V-Form units, Jones used Acrow-Span horizontal shores to support the deck forming between two large beams.

Footings

The sprawling structure is founded on 425 drilled caisson footings ranging from 24 to 78 inches in di-

(Continued on page 16, col. 4)

A Wagner Scoopmobile with a high tower raises a load of V-Form panels to the first-floor level of the structure for use in forming the second floor. A number of different uses was made of the Scoopmobile on the project.



KOHLER ENGINES

Reliable power for construction equipment

The name KOHLER, recognized and respected the world over as a mark of value, is your assurance of undivided responsibility and top performance.

Kohler engines are rugged, quick-starting in all weather, conservatively rated. Short stroke design gives maximum usable power, cuts engine friction.

Sold and serviced through a nation-wide organization, Kohler engines are increasingly being installed on a wide variety of construction, agricultural and industrial equipment. They power Kohler electric plants, known everywhere for reliability.

Kohler Co. has manufactured internal combustion engines for 40 years.

FROM 4 TO 24 H.P. *Write for illustrated booklet.*

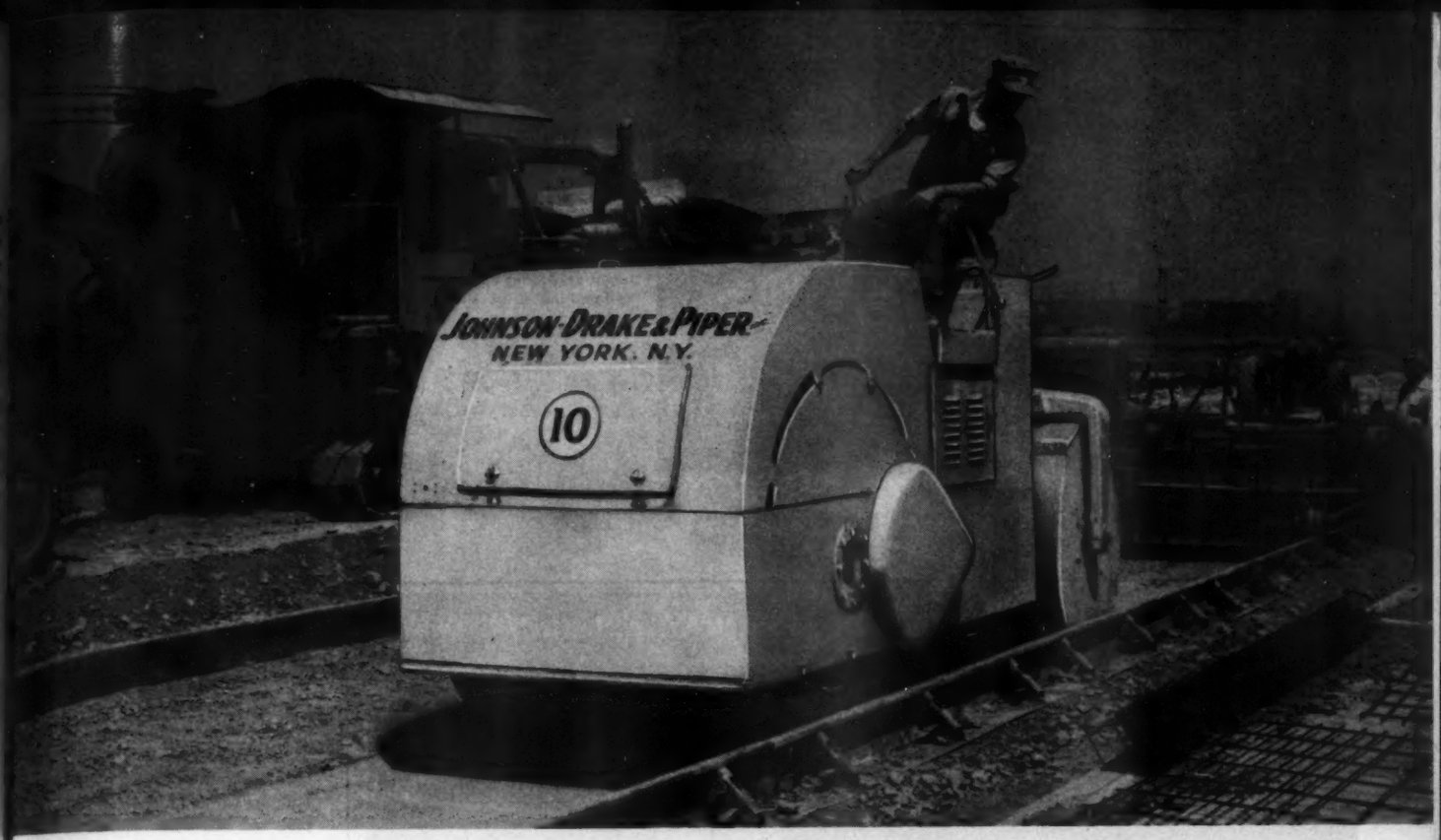
KOHLER CO. *Established 1873* KOHLER, WIS.

MODEL
K161
4-cycle
Short stroke
Air-cooled

KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

For more facts, use Request Card at page 18 and circle No. 257



MINNEAPOLIS, MINNESOTA—Johnson, Drake and Piper, general contractor in heavy construction work, use Huber-Warco equipment on many of their projects. This Huber-Warco 8–12 ton tandem roller is compacting base inside concrete forms on one of the company's turnpike projects in the Buffalo, N. Y. area.

HUBER WARCO

HUBER-WARCO *tandem rollers*

3-5 ton 4-6 ton retractable 5-8 ton 8-10 ton 8-12 ton 10-14 ton

DRIVE FEATURES — Water-cooled torque converter cushions against shock. Tailshaft governor maintains desired speed regardless of grade for easy, accurate control. Two-speed transmission* prevents loss of efficiency in tailshaft governor or hydraulic steering at all rolling speeds.

KING OF KINGPINS—Complete freedom from kingpin and swivel pin looseness. Tapered roller bearings permit "like-new" adjustment. No road scuff in reversing. Kingpin and housing easily removable.

CONTROL FEATURES — Variable hydraulic control adjusts to steering "feel" best for operator. Dual controls. Parking brake system completely independent.

PERFORMANCE PLUS — Work within less than 2 inches of buildings. Unsurpassed visibility. Final drive mounted in the frame, not on it, for longer shaft, gear and bearing life.

**Except for 3-5 ton and 4-6 ton models.*

A trusted product name backed by respected distributor names from coast to coast

MOTOR GRADERS

Standard transmission models from 83 to 160 H.P. Torque converter and power shift transmission models from 102 to 195 H.P.

TANDEM ROLLERS

3-5 Ton • 4-6 Ton Retractable • 5-8 Ton • 8-10 Ton • 8-12 Ton • 10-14 Ton

3-WHEEL ROLLERS

10-Ton • 12-Ton • 14-Ton Standard Weight 10-12 Ton • 12-14 Ton Variable Weight

MAINTAINER

M-52 — 45½ H.P. Attachments are Lift-Loader, Broom, Bulldozer, Patch Roller, Scarifier, Snow Plow, Berm Leveler

HUBER-WARCO COMPANY Marion, Ohio, U.S.A.

For more facts, use Request Card at page 18 and circle No. 258

THIS HYDRAULICALLY SUSPENDED 100-TON TRAILER transports huge transformers for the Kariba Dam hydroelectric project in Central Africa. The trailer has 32 wheels distributed between two identical bogies, one at each end. Each bogie has four rows of axles, with two rocking axles in each row. The trailer was specially designed and built by Cranes (Dereham) Ltd., Norfolk, England. The dam harnesses the Zambesi River where it flows through the Kariba Gorge. It will have an annual output of electricity exceeding 8,500,000 kwh, and will supply power to the Copper Belt and industrial centers in the Federation of Rhodesia and Nyasaland.

FREEWAY or THRUWAY...The BETTER WAY is the *wix* WAY!

WIX Filter Cartridges are engineered specifically for every engine in construction service... gasoline or Diesel — mobile or stationary—for lube, fuel, and air. Replacement Cartridges are available for:

CATERPILLAR · DETROIT DIESEL
INTERNATIONAL
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Construction Equipment

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Filter Survey by WIX Factory-Trained Specialist, plus a Maintenance Manual.

Only with WIX do *all* your engines get *all* the advantages of Prescription Filtration . . . the exclusive WIX Filtration that paves the way to reduced maintenance costs and increased profits. WIX Hevi-Duty Oil and Air Filter Cartridges remove contaminating abrasives, sludge, and dirt —keep the equipment on your spreads operating more efficiently, more economically. Even under the worst working conditions and toughest time schedules, you'll do better with WIX!

And, WIX offers you a FREE Filter Survey that lists the correct lube, fuel, and air filter cartridge replacement for each one of your engines. No heavy inventory for you—your local WIX wholesaler stocks a reserve supply—one convenient source for fast filter service. Ask your Jobber, or write us TODAY!

wix® FILTERS

SPECIFIED FOR ORIGINAL EQUIPMENT AND REPLACEMENT BY MAJOR MANUFACTURERS

WIX CORPORATION · GASTONIA, N.C.
In Canada: Wix Corporation Ltd., Toronto
In New Zealand: Wix Corporation New Zealand Ltd., Auckland

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(*Contined from page 14*)

ameter and from 6 to 34 feet deep. Larsen Drilling Co., Denver, used a Calweld drilling machine to excavate the caissons.

Another early operation in the project was the installation of a huge perimeter drain around the entire building area. A 36-inch concrete pipe was laid with open joints completely around the area and outletted into a storm sewer.

When the concrete frame and floor slabs of the 4-story classroom sections were erected, Acrow scaffolds were set to serve the entire face of the building. Masonry subcontractor Matt Jahn's crews utilized this scaffolding for laying the brick and tile exterior walls.

Although most of the structure was of reinforced-concrete construction, the combination auditorium and gymnasium wing has a structural steel roof of rigid frame design over the gymnasium and deep steel trusses over the auditorium. Structural steel was fabricated and erected by Midwest Steel Co., Denver.

The building includes some 17,000 cubic yards of structural concrete that required more than 650,000 square feet of forming.

Personnel

E. B. Jones, president of the construction firm of A. A. & E. B. Jones, spent a considerable amount of time at the site and served as project manager of the job. Other supervisors included superintendent Cy Brainerd, carpenter foremen Dal Brooks, Nick Pedersen, and Bob Fehlman, and labor foremen Herb Montieth and Tony Protone.

Representing the Denver school system and Buell & Co. was resident architect David B. Douglas.

THE END

Kelley Machine moves

■ The Kelley Machine Division of the Wiesner-Rapp Co., Inc., Buffalo, N. Y., has moved to larger quarters at 285 Chicago St. The new location has 30,000 square feet of floor space and will permit the firm to use a larger, more efficient assembly line in manufacturing its products.

Management

Elements of leadership

This is the fifty-second of a series of articles on Construction Management by George E. Deatherage, P. E., The National Schools of Construction, Satsuma, Fla. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by George E. Deatherage & Son, Construction Consultants, Satsuma, Fla.

by **GEORGE E. DEATHERAGE, P. E.**
construction consultant

Business management, scientific management, and creative management should all be at work in a construction organization. Of the three, perhaps the most difficult to secure is creative management, which depends on resourcefulness, inventiveness, and the ability to produce ideas.

The production of ideas follows a definite process. The initial phase of the assembly-line thought process starts on a construction job when the estimator forms a mental picture of the various operations necessary to do a certain piece of work. He does this so that he may measure and price labor and materials entering into the job. At this stage, the estimator, consciously or subconsciously, sets down his immediate conclusion as to the minimum number of operations or steps required to get the job done.

The development of his mental picture of a job depends on past experience, knowledge of known processes, and ability to select the best method. If the estimator is an unimaginative, routine-minded person, he is not apt to question the old methods of doing the work. His opposite is an estimator searching for new combinations of men, materials, and machines to do a job in a better way.

New processes are a new combination or aggregation of elements, materials, and methods. When the superintendent or project manager searches for this, he is using a technique known as invention.

Although this new aggregation of things—each of which has been done before—may decrease cost and increase production, it may not be patentable. Still, the thought applied to the problem of doing a job has evolved a valuable new technique.

Process charts an aid

Once a new idea takes shape, the flow diagram and process chart, together with the use of appropriate symbols, may be used to set the idea down on paper. The various operations in the contemplated process can be set down in the proper sequence. If steps are done simultaneously, this can be indicated. Giving form and structure to the budding idea makes it easy to analyze.

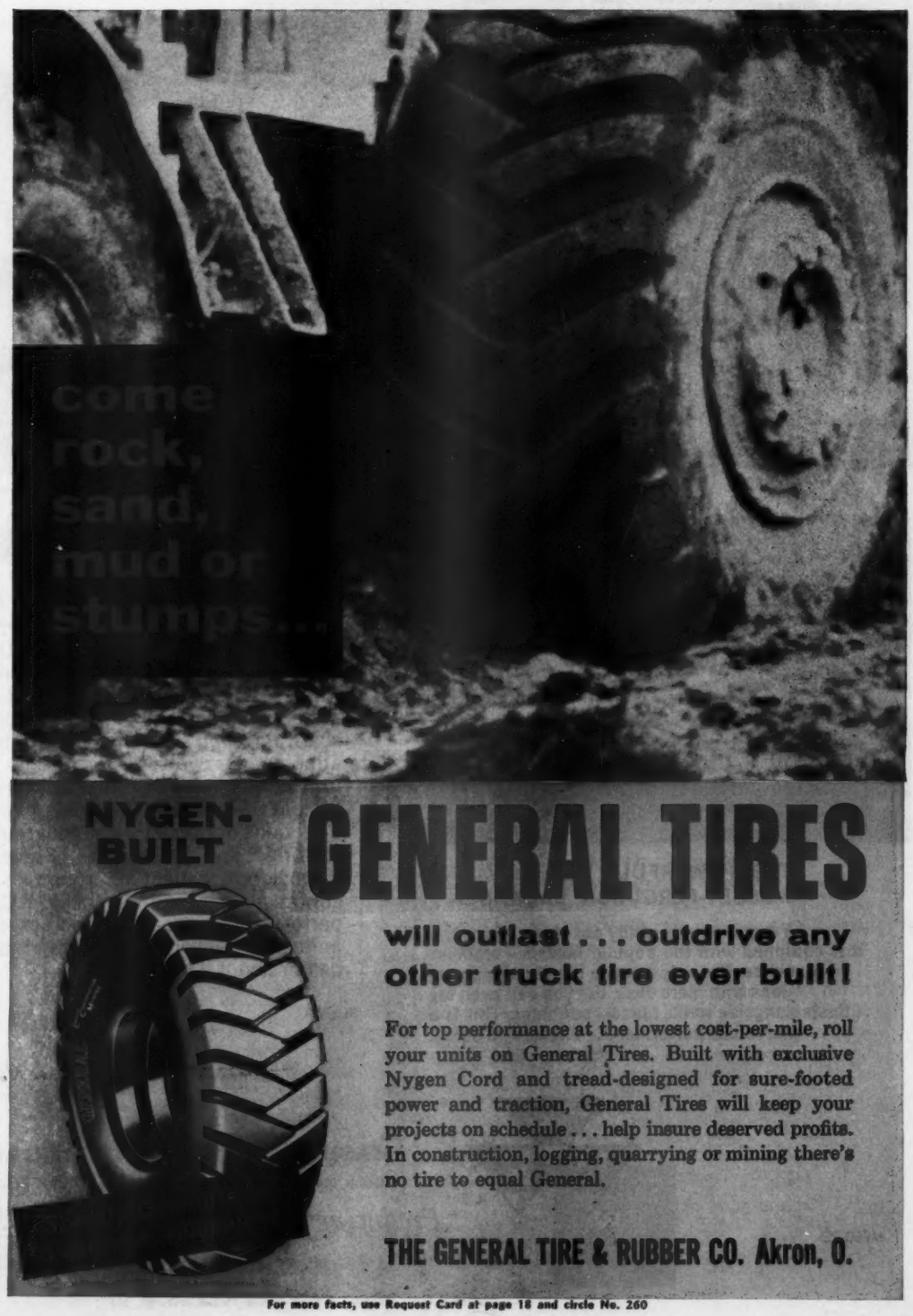
In making the analysis, questions to ask are "How, why, where, when, what, and who?" You may ask, "Why is it done? How is it done? Who does it? Does it need to be done at all? Can someone else do it cheaper?"

Once the idea comes to mind, it should immediately be set down on paper. Later, the note can be expanded by preparing preliminary flow sheets or process charts.

Training the mind

Particular bits of knowledge in themselves are not very important. One may know much about various materials, labor, costs per unit, engineering, labor relations, etc., and still not be the most effective construction superintendent because of a lack of

(Continued on page 19)


come
rock,
sand,
mud or
stumps...
NYGEN-
BUILT
GENERAL TIRES
will outlast . . . outdrive any
other truck tire ever built!
For top performance at the lowest cost-per-mile, roll your units on General Tires. Built with exclusive Nygen Cord and tread-designed for sure-footed power and traction, General Tires will keep your projects on schedule . . . help insure deserved profits. In construction, logging, quarrying or mining there's no tire to equal General.
THE GENERAL TIRE & RUBBER CO. Akron, O.
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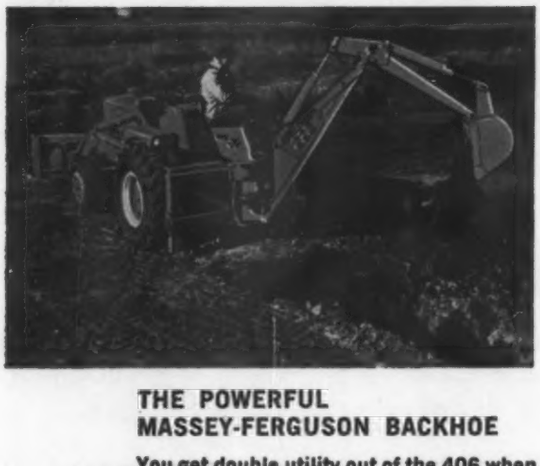
FOR SPEED . . . POWER . . . ECONOMY

the MASSEY-FERGUSON 406

speaks for itself:

"HAVE DONE . . .

"CAN DO!"



THE POWERFUL MASSEY-FERGUSON BACKHOE

You get double utility out of the 406 when it is equipped with the popular Massey-Ferguson Backhoe. Not only can you handle all digging jobs with more ease, but you can even dig flush alongside walls, fences, buildings. This is a marvelous performer . . . that has no equal.

featuring INSTANT REVERSE

Here's why this Massey-Ferguson 406 Tractor Shovel says "Can DO" to so many different jobs: it's because it has an excellent record of "Have Done."
It can push tons of earth . . . fast and at low cost . . . when equipped with this matched angle dozer attachment. Or, it can load, stockpile, do clean-up work, scarify — even sweep because of the many integrated attachments available for it. This 1-cu. yd. (SAE rated) unit is equipped with Massey-Ferguson's unique Instant Reverse and Torque Converter. You change directions of travel by a simple touch of the toe — no shifting . . . no clutching . . . or levers to pull.
It provides excellent all-around visibility because the control zone is centrally located. Compare it for performance, versatility, and cost against any machine in its class. Ask your Massey-Ferguson Industrial dealer about it today!

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MASSEY-FERGUSON INDUSTRIAL DIVISION
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MF60-22

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(Continued from page 17)

understanding of the principles and functions of construction.

On the other hand, one may know none of these things but have an insight into principles and methods that, with the assistance of experienced and competent men, secures excellent results. It is important to train the mind to produce ideas and grasp principles. The ability to bring old elements into new combinations depends largely on an ability to see relationships.

When relationships are recognized, they form a path to one general principle that suggests the key to a new combination, and the end result is a new idea. A person can actually direct himself in using the assembly-line method by which ideas are developed. This method is composed of five steps: gathering of information and data; digesting of the material; incubation; revelation of the idea; development and refinement of the idea.

The first step, gathering the information and data, must be completed before the others take place. In construction, the specific data to be compiled are anything relating to materials, machines, and methods. Gathering data can be broken down into two phases: specific and general information. An essential step is the systematic clipping and filing of informative data. One should go beyond surface differences and delve deep enough to discover any individual relationships in materials, machines, and methods.

A practical suggestion is to jot down every bit of data on cards and to index it. Clippings can be conveniently filed in scrapbooks. Further indexing and cross-indexing of the material will help in seeking relationships.

Digesting the material gathered is the second step. Details of information are looked at from different angles. Here, what is being sought is the relationship between this new bit of information about materials, machines, or methods and its use in construction; or how it might be combined with other materials, machines, or methods to produce a new result.

As this mental process is going on, nebulous ideas will occur. It is important to jot these down in a notebook, regardless of how incomplete or hazy they may seem.

In step three, the incubating stage, the matter is dropped and put completely out of the mind. The whole process is turned over to the subconscious.

In step four, the idea is born. This step assumes that the other three stages of the idea-creating process have been followed. Very often, the idea will come when it is least expected. Many times, the solution that comes out of the blue sky may be so radical that even the searcher will have doubts of its validity.

There is one more phase—the idea must be put to work. In this stage, the idea requires a great deal of refining and working over before it is ready to be tested. It is advisable to discuss it with people who might be interested and submit it to criticism. If the idea is a good one, it will stimulate helpful suggestions.

You can collect ideas by collecting words, for words are idea symbols. Once a new process or product is developed, words are required to describe it. If you think about concrete, for instance, you can apply thousands of words to it. The words "fire resistant," used in conjunction with concrete, can give rise to many combinations of ideas concerning concrete. The word "polished" may suggest the idea of a plain concrete that can be polished, like terrazzo. Would this require some chemical or compound that would harden sand and aggregate sufficiently so that concrete could be polished with an ordinary or special polishing machine?

The next questions to be asked are: How can this be done? What materials will be needed to produce this result? This can be developed into a train of thought that leads to action to prove theories that occur along the way. This idea has not been the result of inspiration; a purely mechanical aid has been used to generate it.

Any intelligent person can be taught and trained to create new and unusual ideas about materials, machines, and methods. If you follow the five basic steps and practice them consistently, creative thought will become a habit.

(Next month's article will deal with "Management: Job control.")

American Cyanamid names project engineer

■ Leslie G. Holleran, Jr., has been transferred from the Lederle Laboratories to the Engineering & Construction Division of American Cyanamid Co., New York City. As senior project engineer, his first assignment will be the company's new executive and administrative headquarters building in Wayne Township, N. J.

U. S. Steel division news

■ Lloyd S. Campbell has been named vice president of Michigan Limestone, a division of U. S. Steel Corp., Pittsburgh. He has been assistant to the vice president of operations of Oliver Iron Mining, another division.

VULCAN pile extractors

Size No. 200-A for pulling the less difficult piles
Size No. 400-A for extracting commonly used sizes and lengths
Size No. 800-A for heavy duty service
Size No. 1200-A for the heaviest, longest and most difficult piles of all types

A SIZE FOR EVERY DUTY

4 sizes

In Vulcan Pile Extractors you have the most compact, dollar-saving equipment for pulling any and every type of pile... in a range of sizes that assures maximum efficiency and economy for the particular job handled. Note the four ranges listed. When so used there is more crane pull—more economy—because there is no power wasted in lifting unneeded weight.

Hundreds of users say that there is no pile extractor like Vulcan. Economies often repay its original cost in a single job. No harness or accessories are needed. No loss of power as with wire rope harness. There is only one moving part; no adjustments needed; nothing to get out of order.

No assembly is necessary to put it to work. Just hang it on the crane hook, attach hose, start the pull, and you're under way. The specifications tell the story. Ask for bulletin.

SPECIFICATIONS

SIZE OF EXTRACTOR	No. 200-A	No. 400-A	No. 800-A	No. 1200-A
Net Weight, Including Connecting Links, Lbs.	1500	2850	5460	9200
Shipping Weight, Lbs.	1600	3000	5700	9650
Overall Length, Omitting Connecting Links, Inches	71	80	94	109½
Overall Length, Including Connecting Links, Inches	93¼	109½	127⅜	150⅝
Extreme Width, Over Side Bars, Inches	17	22½	29	34⅝
Extreme Depth, Front to Back, Inches	13½	15½	20	24½
Width at Lower End of Connecting Link, Inches	7	7½	8½	7¼
Height of Opening in Loop of Lifting Cap, Inches	7	7	8¼	10½
Width of Opening in Loop of Lifting Cap, Inches	3½	3½	4	5½
Weight of Ram, Lbs.	200	400	800	1200
Blows per Minute: at 100 Lbs. Per Sq. Inch	550	550	550	530
Maximum Crane Pull, Tons	25	40	50	100
Minimum Crane Pull to Operate, Lbs.	3600	7100	13900	21000
Boiler Horsepower, Normal Rating	18	25	40	65
Boiler Horsepower, A.S.M.E. Rating	24.2	48.6	97	140
*Volume of Free Air, Cu. Feet Per Minute	173	342	740	1020
†Volume of Free Air, Cu. Feet Per Minute	312	615	1330	1850
Normal Operating Pressure, Lbs. Per Sq. Inch	100	100	100	100
Size of Connection for Hose, Inches	1	1¼	1½	2
Hole in Connecting Link, Diameter, Inches	2⅛	2⅝	2⅝	2⅝
Number of Holes in Connecting Link	1	2	2	3

*Adiabatic Compression Assumed †Isothermal Compression Assumed

VULCAN IRON WORKS INC.
327 NORTH BELL AVE., CHICAGO 12, ILLINOIS

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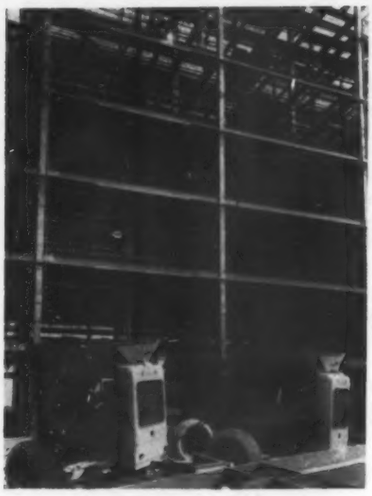


SOME 800 TONS OF STRUCTURAL STEEL and 400 tons of bar joists form the skeleton of a new apartment building in Cleveland, Ohio. The 10-story structure covers 212,000 square feet. Builder's Structural Steel Co. is using E-6010-type electrodes for all welds. Hobart welders supply power for the welding.

BTEA elects president

■ The Building Trades Employers' Association of the City of New York has elected I. Roy Psaty its president. He is president of Psaty & Fuhrman, Inc., general contractors. Psaty, who has served three years as vice president of the organization, succeeds Joseph A. Courter.

Other officers elected are: vice president, Jack W. Zucker, president of The Shatz Painting Co., Inc.; second vice president, Nicholas B. O'Connell, vice president of the Turner Construction Co.; third vice president, Jeremiah Burns, president of Jeremiah Burns, Inc.; and treasurer, Edward J. Fee, vice president of Starrett Bros. & Eken, Inc.

I. Roy Psaty, president of the Building Trades Employers' Association of the City of New York.

Peter W. Eller continues as chairman of the board of governors, and H. Earl Fullilove as vice chairman.

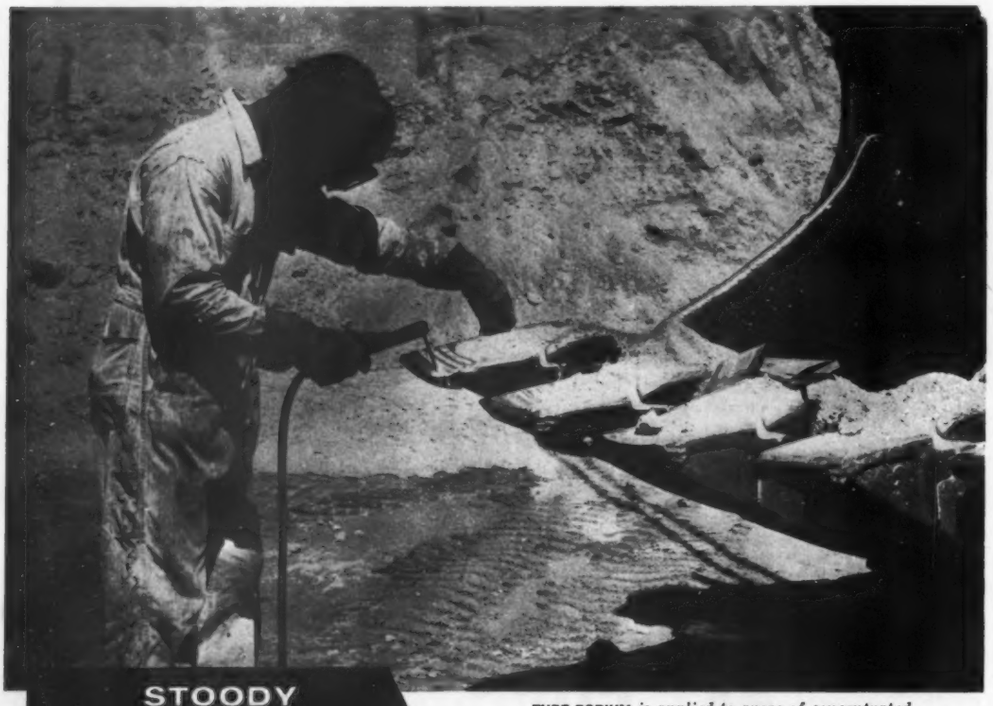
Four Corps employees receive awards for work

■ Four employees of the U. S. Army Engineer Division, North Atlantic, have received Sustained Superior Performance awards.

Harold R. Gaskell, assistant chief of the Military Construction Branch, Construction-Operations Division, received a certificate and a cash award of $250. Gaskell has displayed exceptional ability in solving the complex problems encountered in overseas construction, and has shown sound engineering, tact, and diplomacy in contract negotiations.

Miss Addie H. Gibbs of the Travel Section won a cash award of $100, as did Innis A. Horsford.

Richard S. Rahte, assistant chief of the Safety Branch, received a $250 award. He was given the special assignment of instructing personnel of the division, including six districts, in radiological monitoring. Rahte constructed a comprehensive course outline and instructors' manual, which has since been adopted for use throughout the Corps. He has, on his own initiative, furthered the training program so that the division is the leader in the field of radiological recovery capability in the Corps.



TUBE BORIUM *is applied to areas of concentrated wear, such as teeth, for maximum wear protection.*

STOODY
SEMI-AUTOMATIC
HARD-FACING
+
TUBE BORIUM

where the going is toughest!

STRINGER BEADS *of Stoody 121 and Stoody 100 applied semi-automatically keep buckets in good condition.*

Usual maintenance procedures just couldn't keep buckets and teeth in shape on this job...wear was too severe. The answer was found in the semi-automatic welder applying Stoody 121 and Stoody 100 to bucket lips, sides, and runners, and to teeth and adapters.

But even then, teeth needed additional protection. To keep them digging efficiently, points were treated twice a day with several beads of Stoody Tube Borium, using manual electrodes. Tube Borium is the "last word" for protecting earth-working equipment where the going is toughest. A few beads virtually form a layer of pure tungsten carbide—your assurance of maximum wear.

Have you investigated the semi-automatic welder and Stoody hard-facing wires in your own operations? Stoody dealers (consult the "yellow pages" of your phone book) are glad to demonstrate the machine in your own plant. Write for details.

STOODY COMPANY

11904 E. Slauson Avenue • Whittier, California

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"The boss felt he needed a new salesman for this line."

This is how Fleetwood Square, a $3 million construction-industry center in Dallas, will look when it is completed in 1961. Work starts shortly on the 253,895-square-foot exhibit-office structure designed to serve the construction industry.

4 Ton Ganged Section, 22 Ft. by 28 Ft. Used for . . .

28′ High Circular Walls of Sewage Plant

Friebel & Hartman, Shelby, Ohio contractor, was able to strip and reset 2,300 square feet of forms on the inside gang section in 3½ hours. A ¾ yard crane with an 80′ boom handled the sections. 8 men in less than 8 hours erected 2,300 square feet of forms and scaffolding on the outside, plus pouring the concrete. The project was the Mansfield, Ohio Sewage Treatment Plant, which consisted of four digestors, each 80 feet in diameter, 28 feet in height and 8 inches thick with no horizontal joints.

Four ganged sections were used—each 22 feet wide and 28 feet high. This allowed pouring ⅓ of a tank at a time, and a pour every four working days. Weight of each ganged form section was about four tons. By using three trusses to brace each ganged section contractor was able to hold bracing costs to a minimum.

Complete story on the Ohio Sewage Treatment Plant will be sent *free* upon request. Symons Steel-Ply Forms can be rented with purchase option.

Symons CLAMP & MFG. CO.

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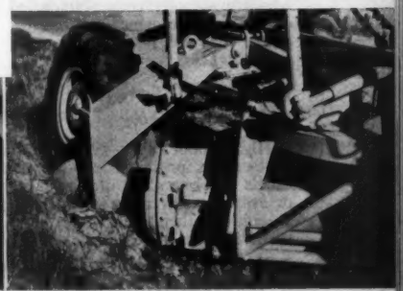
Warehouses Throughout the U.S.A.

-WIDEN-
OW-BORROW

der-Cat Grader Team

picked up later with the
Team.
e output and usage of your
t high-speed loading, *all at*
other single-purpose, self-
r elevating loader.



OFFSET HITCH
With the special offset hitch design, your hauling units follow on the road surface, loading over-the-cab, without obstructing traffic.

ONE-PASS DITCHING
Cutting the ditch with the U-200 Disc Attachment leaves the grader blade free for shoulder clean-up, windrowing and feeding the material to the U-300 Motor Grader Loader.

CORRECT DRAINAGE
You'll get the proper drainage ditch with the U-200 Disc cutting and the grader blade sloping and cleaning up the shoulder.

ULMAC Equipment Co., Inc.

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Ask your Caterpillar Dealer for a demonstration of the Ulmac U-300 Motor Grader Loader-Cat Grader Team, or write direct.

El Paso, Illinois

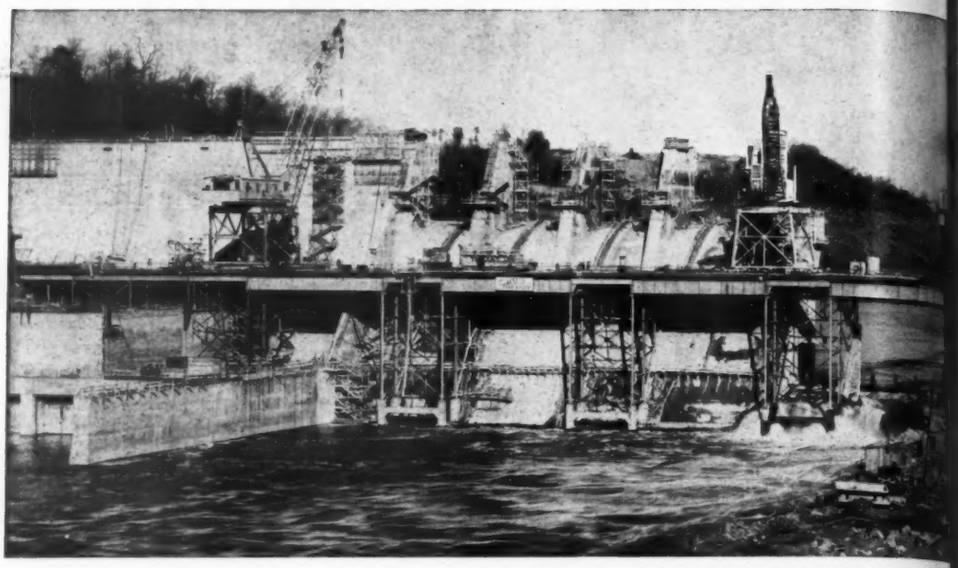
Manufacturers of Auxiliary Equipment for Caterpillar Products

fountains, will seat 150 persons. One of its chief features will be fountains, with changing water patterns, that will be illuminated by varicolored lights. Within Fleetwood Fountains, will be Fleetwood Club, a private organization with members drawn primarily from Tower occupants.

Among services to be provided by the center are the promotion of an annual trade show, a continuous advertising and public-relations program, and a monthly bulletin that will inform members of the industry about the activities at the center.

Actual construction work on Fleetwood Center gets under way this season; it is scheduled for occupancy in 1961.

For more facts, circle No. 266→



Clyde Whirley No. CW-3264 on Douglas Dam job. Also shown is No. CW-3266, now in use at Widows Creek Steam Plant near Stevenson, Ala.

Performance record of Crane No. CW-3264 shows why

Clyde Whirleys are best for dam construction

The severest appraisal of value of a machine is its record of performance . . . its use and re-use on work for which it has been engineered. Continued re-use over many years writes a record of longevity of useful and profitable service such as this record of Clyde Whirley No. CW-3264:

1940 Received new at Cherokee Dam near Jefferson City, Tenn.

1942 Douglas Dam near Dandridge, Tenn.

1943 Fontana Dam near Bryson City, N. C.

1946 Sold. Used at Davis Dam near Kingsman, Ariz.

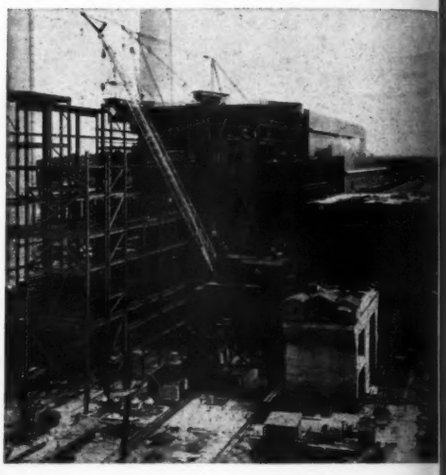
1950 Re-purchased by original owner. Used at Boone Dam near Elizabethton, Tenn.

1952 Fort Patrick Henry Dam near Kingsport, Tenn.

1953 Gallatin Steam Plant near Gallatin, Tenn. through 1959.

1960 Colbert Steam Plant near Tuscumbia, Ala.

Pre-World War II and into the 'sixties'! Repurchased by the original owner! What better recommendation for the quality engineering and rugged and dependable construction of Clyde Whirleys . . . or any other material handling equipment that bears the Clyde trademark?



Clyde Whirley No. CW-3264 at work on the Gallatin Steam Plant. Boom length has been increased to 167'. Gantry has been increased to 62' and will be increased to 95' for Colbert Steam Plant job. Hoist motor size has not been increased.

. . . and No. CW-3264 is still in the prime of its youth!

CLYDE

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

CLYDE IRON WORKS, Inc.

Established 1899

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HOISTS • DERRICKS • WHIRLEYS • BUILDERS TOWERS • UNLOADERS • CAR PULLERS • ROLLER

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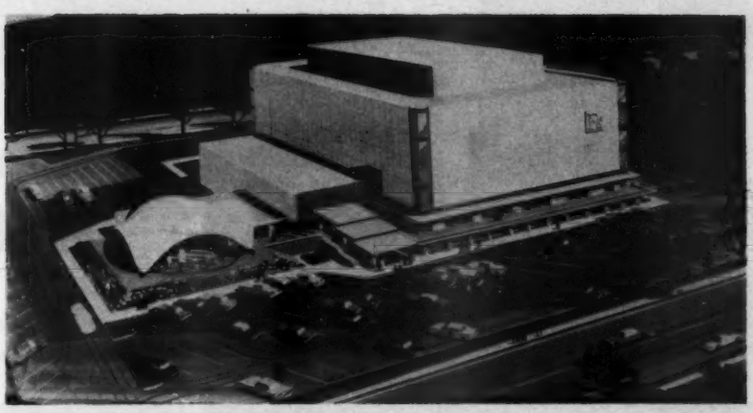
New exhibit center planned as showcase for construction industry



This is how Fleetwood Square, a $3 million construction-industry center in Dallas, will look when it is completed in 1961. Work starts shortly on the 253,895-square-foot exhibit-office structure designed to serve the construction industry.

Work is ready to start on a $3 million, 253,895-square-foot construction-industry center in Dallas, Texas, that will serve the entire cross section of the industry—engineers, general contractors, subcontractors, dealers, architects, home builders, and decorators.

The ultramodern center, to be known as Fleetwood Square, will be constructed at 5206 Maple Ave. by Dallas builder Edmund G. P. Peterson in association with independent oil operators Bright & Schiff. The architect is George L. Dahl, Dallas.

The showcase will house 150 national manufacturers of building materials, providing them with display facilities—and office space—on a year-round basis.

Plans for the center include the multistory office-exhibit building, a public restauruant and private club, a fully equipped auditorium and banquet hall, an auxiliary exhibit and display facility, a technical library, and a 126-car underground executive garage to supplement the 250-car public parking lot.

The office-exhibit section, to be known as Fleetwood Tower, will provide a minimum 19-foot corridor exhibit space to allow an ample flow of traffic through the display areas. From the corridors, visitors will be able to see and examine samples at close range.

The auditorium and banquet hall, called Fleetwood Terrace, will be able to accommodate 560 persons. It will have a prosceniuum stage with sound and lighting systems for all types of presentations and special events.

Directly above the auditorium will be Fleetwood Gallery, which will provide an auxiliary exhibit area. When it is not being used for manufacturers' displays, the management will provide displays of general interest.

The public restaurant, Fleetwood Fountains, will seat 150 persons. One of its chief features will be fountains, with changing water patterns, that will be illuminated by varicolored lights. Within Fleetwood Fountains, will be Fleetwood Club, a private organization with members drawn primarily from Tower occupants.

Among services to be provided by the center are the promotion of an annual trade show, a continuous advertising and public-relations program, and a monthly bulletin that will inform members of the industry about the activities at the center.

Actual construction work on Fleetwood Center gets under way this season; it is scheduled for occupancy in 1961.

For more facts, circle No. 266→

NOW! DITCH-STRIP-WIDEN-LOAD WINDROW-BORROW *with the*

New ULMAC U-300 Motor Grader Loader-Cat Grader Team

With the U-300 hitched to your present motor grader and the Ulmac Disc Attachment cutting the ditch, you cut, grade and load your hauling units in one fast, easy operation.

And the quick detachable hitch design lets your grader operator do other road and shoulder maintenance work, windrowing the material to be picked up later with the U-300-Cat Grader Team.

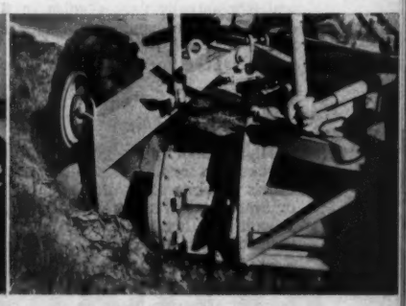
You multiply the output and usage of your Cat Grader and get high-speed loading, *all at less cost than any other single-purpose, self-propelled loader or elevating loader.*

OFFSET HITCH

With the special offset hitch design, your hauling units follow on the road surface, loading over-the-cab, without obstructing traffic.

ONE-PASS DITCHING

Cutting the ditch with the U-200 Disc Attachment leaves the grader blade free for shoulder clean-up, windrowing and feeding the material to the U-300 Motor Grader Loader.



CORRECT DRAINAGE

You'll get the proper drainage ditch with the U-200 Disc cutting and the grader blade sloping and cleaning up the shoulder.

ULMAC Equipment Co., Inc.

El Paso, Illinois

Caterpillar, Cat and Tractomotor are Registered Trademarks of Caterpillar Tractor Co.

Ask your Caterpillar Dealer for a demonstration of the Ulmac U-300 Motor Grader Loader-Cat Grader Team, or write direct.

Manufacturers of Auxiliary Equipment for Caterpillar Products

The work horse of the scraper fleet on the grading of a new plant site near Madison, Tenn., is the twin-engine Euclid TS-24 pushed by a D9. Here it picks up overburden, which averaged about 4 feet in depth.

Scrapers move fast on plant-site grading

Eight-unit fleet moves over 160,000 yards of material in two months to grade area for manufacturing plant

In just two months' time, McDowell & McDowell, Nashville, Tenn., moved over 160,000 cubic yards of rock and earth—at a rate of 7,000 yards per shift—to complete the clearing and grading of the new Gates Rubber Co. plant site north of Madison, Tenn. About 50 per cent of this yardage was rock, and over 40,000 yards of it had to be removed for tunnels and basements below the floor-slab level.

Shallow overburden

McDowell & McDowell removed the shallow overburden, which averaged about 4 feet throughout the 20-acre site, with a fleet of scrapers led by a Euclid TS-24 twin-engine scraper. Four Euclid S-22's, an S-18 and two Caterpillar DW20's rounded out the fleet. A Cat D8 and two D tractor-dozers handled the push-loading of the scraper fleet.

The scrapers were worked during a single 10-hour shift, while the drilling units operated in two 8-hour shifts.

Rock drilled

The contractor used three truck-mounted Joy drills, together with six wagon drills, to sink 2¾-inch-diameter blast holes from 3 to 10 feet for most of the area. The Joys, using 20-foot drill steel, sank blast holes 15 feet for the many trenches. These generally were set within a 7X7-foot drill pattern and blasted for the full depth. Six 600-cfm air compressors powered the drill rigs.

The trenches are about 18 feet wide with minimum depths of 13 feet.

Blasted rock used in low spots on the 20-acre plant site is loaded out to a Euclid 91FD rear-dump by a Lorain 820 shovel with 2-yard bucket.

ALPHA

BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS

news and notes from the field

MIXING WATER CAN BE COSTLY!

Water is used in concrete to lubricate the mix and act chemically with the cement to form the paste which glues the aggregates together. Too much water dilutes the paste and makes it weaker—less solid.

How Much is Too Much?

In a 5-bag concrete mix using about 36 gallons of water per cubic yard—including moisture in the aggregate—only about *half* the water combines with the cement. The rest is a lubricant which eventually causes voids in the concrete. Recommended slumps for different jobs are listed in the table at upper right.

Results of Too Much Water in a Mix

1. Higher labor costs—When workmen have to wait for the mix to stiffen or for excess water to soak into the subgrade or evaporate, overtime costs run high. In cold weather, as much as 6 to 12 hours in extra time can be the result.

2. Excessive bleeding—As concrete bleeds, water comes to the surface. If there is excessive bleeding, the water brings aggregate fines to the surface which often causes dusting and crazing.

3. Sand-streaked walls—Excess water bleeds up the sides of forms, washing out the cement paste leaving a streaked, raw, unattractive wall surface.

4. Segregation—Coarse aggregates settle to the bottom, leaving a weak layer of water and fines on the surface. The lower sections of the concrete often have honeycombed areas because of cement-water paste leaking out of the forms.

5. Excessive cracking—Foundation walls and floors crack excessively from high shrinkage and low tensile strength caused by excessive mixing water.

6. Rough surface—It is more difficult to get a smooth surface because deep trowel marks are a common problem in concrete containing excessive amounts of water.

7. Leaky walls and wet floors—Both can result from excessive voids in concrete caused by too much water.

8. Surface scaling—Air is entrained in concrete to protect it from freezing and thawing damage. When the slump is greater than 6 inches, the air content decreases and this important protection is reduced.

Stiff concrete is much less expensive when measured in man hours. It may require more labor initially to get it in place but can be finished sooner . . . your bonus is a satisfied customer—and a good job that will not have to be repaired or replaced.

Recommended Slumps for Various Types of Construction*

Type of Construction	Slump, in.**	
	Maximum	Minimum
Reinforced foundation walls and footings, and thin plain walls	5	2
Plain footings, caissons, and substructure walls	4	1
Slabs, beams, and reinforced walls	6	3
Building columns	6	3
Pavements	3	2
Heavy mass construction	3	1

*Adapted from Table 4 of the 1940 Joint Committee "Report on Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete."

**When high-frequency vibrators are used, the values given should be reduced about one-third.

AN ALPHA EXCLUSIVE

FIRST NUCLEAR POWERED commercial ship, the N. S. Savannah, being built by New York Shipbuilding Corp., Camden, N. J. Alpha cement has been chosen for building the heavy concrete encasement used for the atomic reactor shield. Concrete will weigh 260 lbs. per cu. ft. compared to normal weight of 145 lbs. per cu. ft. Job is continuous pour by pressure or injection grouting, done by Intrusion Prepakt Company of Philadelphia. Alpha cement will be supplied by the Camden Lime Co., Camden, N. J.

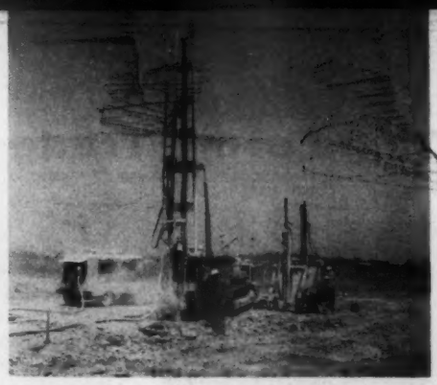
ALPHA

PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.

For more facts, use Request Card at page 18 and circle No. 267

An old American tractor carries two Gardner-Denver wagon drills on the job. A G-D 600-cfm compressor at the rear powers the drills.



A Joy drill, mounted on a D6, uses 20-foot drill steel to sink blast holes for the trench excavation. Behind the tractor are two track-mounted Joy drills using shorter drill steel. A Gardner-Denver 600-cfm compressor powers one of the drills.

The blast holes were loaded with Du Pont 60 per cent dynamite as a primer charge and then topped with Du Pont Nilite, an ammonium-nitrate mixture. Electric blasting caps, together with up to 10 millisecond delays, were used to control the blasting. About one pound of dynamite and Nilite—averaging 1/3 dynamite and 2/3 Nilite—was required to produce about one cubic yard of blasted limestone.

A Lorain 820 shovel with a 2-yard bucket and a Northwest 80-D with a 2¼-yard bucket handled the rock excavation. The material was hauled to fill areas in a fleet of six Euclid OLFD rear-dumps. All the overburden excavation, however, was stockpiled on the site to be used later for backfilling and landscaping the plant areas.

The Rust Engineering Co., Pittsburgh, Pa., general contractor for the $18 million project, is now erecting the plant on the site.

Personnel

Marvin J. Terrell was the project manager, and H. G. Thompson the superintendent for McDowell & McDowell. THE END

Revised design book for civil engineers

■ A completely revised third edition of Volume 1 (Design) of "Data Book for Civil Engineers," by Elwyn E. Seelye, is available from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Volume 1 is priced at $24. The book contains a complete analysis of the latest data, methods, and criteria used by design engineers.

A partial list of new features and revisions covers such topics as: prestressed concrete, ultimate strength design of concrete, plastic design of steel, composite beams, use of aluminum structurally, use of light aggregates in concrete, and special wind pressures. It also covers concrete columns with eccentric loads (presented in push-button chart form for both cracked section and uncracked section), structural timber (including laminated and plywood), pavements, highways, airports, bridges, cathodic protection, water-front structures, drainage, sanitation, water supply, purification and distribution, and petroleum-products handling. Examples have been worked out using arrow flow on all diagrams.

Brinson-Allen's No. 14 is equipped with Preco Automatic Blade Control. This exclusive factory-installed attachment for all Caterpillar Motor Graders saves money on a wide range of applications. With the desired slope set on the dial, the operator only has to control depth of cut. The transistorized unit automatically maintains blade slope within ½ inch in ten feet.

CAT NO. 14 MOTOR GRADER INCREASES PRODUCTION 20 PER CENT

Heavy-duty circle and moldboard on the No. 14 provide big load carrying capacity. Circle and moldboard are strong to match engine power and can absorb the punishment of rough work. Mechanical blade controls provide precise, fast blade adjustment and positive hold.

This Cat No. 14 Motor Grader handles subgrade and base on the western approach of the Interstate System highway bridge between Tampa and St. Petersburg, Fla. Charlie Clyatt, superintendent on the job for owner Brinson-Allen of Tampa, reports, "We have increased production about 20 per cent. The No. 14 has more weight, traction and power, gets the job done quicker. It has never failed to stay well ahead of the base crew."

Here's why the big No. 14 excels in weight, power and traction: It weighs a hefty 29,280 lb. . . . the 150 HP turbocharged engine delivers power to spare . . . 14:00-24 tubeless tires all around provide excellent stability. The 12 ft. (standard) or 14 ft. (optional) moldboards with ample throat clearance between moldboard and circle assure you of greater loads than ever before.

But this versatile motor grader has more than sheer power and weight. Features like the dry-type air cleaner which removes 99.8 per cent of the dirt from intake air means longer service life. The exclusive Caterpillar oil clutch, which operates up to 2000 hours without adjustment, practically eliminates down time for clutch repair. Operator has excellent visibility to front wheels, toe of blade and circle. The power steering and power brakes are designed for operator efficiency and high productivity. These are just a few of the reasons why the No. 14 is the most profitable and productive motor grader in its class.

See your Caterpillar Dealer and ask him to demonstrate the No. 14 on the toughest application *you* can find. See for yourself how the rugged No. 14 can handle the hard work.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

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STEP UP PRODUCTION WITH THE NEW NO. 14

For more facts, use Request Card at page 18 and circle No. 268

Tricks of the Trade

Shop-built telltale of hinges, rod, and pipe keeps blade on grade

An ingenious, yet simple, shop-made gadget served as a precision telltale to help a motor-grader operator keep his blade to exact grade. This type of precision was required in preparing the base in advance of a slip-form paving operation.

The Denver District shops of Peter Kiewit Sons' Co. came up with the idea on the paving of a 6.5-mile section of Interstate 80S (U.S. 6) near Brighton, Colo., last summer.

A short pipe sleeve welded to the back of the grader moldboard holds a short length of steel rod that can

be adjusted vertically and locked in place by a set screw. A spring hinge of the type commonly used on screen doors is welded to the vertical rod, and a short length of lighter rod is attached to the other leaf of this hinge so that it projects out beyond the end of the grader blade. An ordinary butt hinge is attached to the end of this rod so that one leaf of the hinge hangs down freely.

When the device is to be used, a string line is attached to a row of steel stakes along the edge of the roadway. The grader moves up parallel to the line so that the hinge leaf on the telltale is aligned with the string. The gadget is then adjusted vertically so that the blade has the desired cut with the telltale hinge just touching the string line.

Now, the operator of the motor grader sets his Preco automatic blade control to the proper pitch and then moves ahead. He needs only to watch the loose hinge leaf at the end of the telltale. If it is above the string, his blade is too high; if it touches the string and tilts back, he is too low.

This much of the operation is very simple. The real trick was getting the gadget around the steel stakes that support the string line. This is where the spring hinge comes into play.

When the telltale strikes one of the stakes, the spring hinge allows it to fold back out of the way. Then as the grader moves ahead, the spring hinge snaps the telltale back into place over the string. In operation it works perfectly.

Gravity water system high in mountains supplies grading job

An ample supply of water and a gravity system that filled water trucks without any pumping were a boon to the crews of Amis Construction Co., Oklahoma City, building the new highway leading to Rabbit Ears Pass in the Colorado Rockies.

A central water supply was particularly valuable on this job because of the continuous steep grade up the mountainside. Hauling water up the grade from the river below would have been slow and costly. It would have

undoubtedly required more than
two water trucks that served
project, plus a pump to raise the
from the river into the trucks.

BIG MO Tractor

Big MOLINE capacity... matchless

Real Backhoe capacity-Moline-built for easier, safer operation

This powerful, fast-cycling backhoe
12 ft. 6 in. at any point in a 190°
with 7,000 lbs. of digging force at
bite. Hydraulic wrist-action bucket
straight sides and square corners.
operator seat pivots with the boom
allow continuous, unobstructed
of bucket throughout operating
dividually controlled hydraulic
riggers, sealed ball bearings at all
wear points and wide range of
types are typical advantages.

The contractor took advantage of small mountain stream that flows ...h a ravine and crosses the right-...-way within the job limits. He built small concrete diversion dam across ...e stream and installed a 5-inch ...minum pipe in it. With a run of ...e than 500 feet of pipe, he had a ...ravity flow into the top of a 5,000-...llon storage tank set up on the edge ...f a nearby cut.

A quick-acting discharge valve in ...e bottom of the tank and a dis-...harge line extending out over the ...dge of the cut completed the system. The water-truck drivers simply rode ...to the cut under the discharge line, ...pened the valve, and got their load.

Smooth rubber tire attached to grader blade compacts short slopes

Compacting the shoulder cut of a rolled-stone base was a problem until the contractor put an extra wheel on his motor grader. The smooth rubber tire, attached to the blade of the grader, rolled along the short steep slope, compacting the freshly cut material.

The device handled the job well for Concrete Materials & Construction Co., Cedar Rapids, Iowa, which was working on a 6.4-mile stretch of interstate highway in Adair County, Iowa. The asphaltic pavement of the

4-lane highway is supported by a 2-foot layer of rolled-stone base. The layer was put down in two 1-foot lifts.

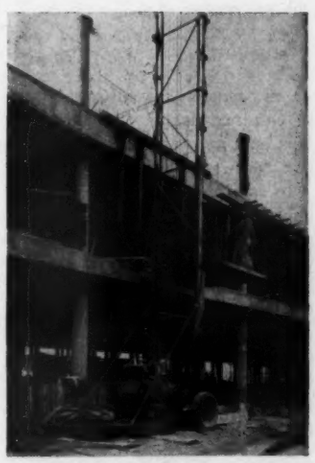
Each lift of the rolled-stone base was cut off on 2 to 1 slopes where the base meets the shoulder material. These slopes had to be compacted and given an extra-heavy prime coat by the contractor.

The edges of the base material were first wetted and then cut with the blade of a Cat No. 12 grader. They were rewetted, if necessary, and then rolled with the extra wheel on the blade.

Automatic hoist tower with safety cutoffs speeds concrete placement

A push-button-controlled hoist tower with built-in safety cutoffs has racked up a good record for Alan Construction Co., Northbrook, Ill., on the site of the new Skokie (Ill.) Junior High School. Using a ⅝-yard bucket, a crew placed 152 cubic yards of concrete in six hours at the third-floor level.

The Buck Hoistower, which delivered building materials to various floors, is controlled by a floor selector and up-and-down buttons. Floor



leveling within plus or minus 1 inch is automatic and may be set at 2-inch intervals for heights over 3 feet. The workman at the upper level locks the platform at floor level until he is ready to return the platform to the ground for reloading.

A 2-element governor switch, provided by Synchro-Start Products, Inc., Skokie, limits the downward speed of the platform. When the platform reaches the speed setting of the first-element switch, a circuit is closed to the up-clutch, through a resistor, which energizes the up-clutch under partial voltage. This creates a braking action against the down-clutch and slows the platform to a safe speed, at which point the up-clutch drops out of the circuit.

When the platform again attains the speed setting of the first switch, the same action occurs and may take place several more times during the cycle, depending on the height of the platform and the load it carries. In the event of up-clutch failure or any other defect that would cause overspeed, the second-element switch takes over to open a circuit to the brake to stop the platform.

tch ackhoe-loader...shuttle reverse

ED YOUR WORK CYCLE with the powerful new BIG-MO TRACTORS *no-clutching shuttle reverse!* You load under full power . . . back away —dump . . . and you're in for the next bucketful while other tractors lagging far behind! It's *all* done with a flip of the lever!

nd the BIG-MO TRACTORS come equipped with *matched* backhoe and ard loader—you can get other *matched* equipment if your jobs require Parts and service are immediately available from your nearby line dealer.

-MO TRACTORS are available in the "500" series with mechanical ttle and standard transmission, or in the "600" series with Moline toe-rated hydraulic shuttle and torque converter drive. See the BIG-MO khoe-loader at your Moline Industrial Dealer or mail coupon today!

ROGER HIPWELL—PHONE WEST 8-3771
Industrial Sales Manager
Minneapolis-Moline, Hopkins, Minnesota

☐ Send me name of my Minneapolis-Moline Industrial Dealer

☐ Send me catalogs on the new BIG-MO TRACTORS.

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COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

MINNEAPOLIS MOLINE *

The fastest-growing line of industrial equipment!

line Dealers give the best part service in the industry.

For more facts, use coupon or Request Card at page 18 and circle No. 269

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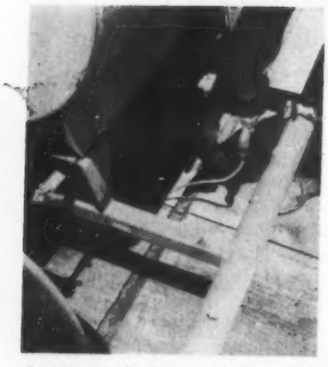
Real Backhoe capacity—Moline-built for easier, safer operation

This powerful, fast-cycling backhoe 12 ft. 6 in. at any point in a 190° with 7,000 lbs. of digging force at po bite. Hydraulic wrist-action bucket straight sides and square corners. operator seat pivots with the boo allow continuous, unobstructed visi of bucket throughout operating ar dividually controlled hydraulic riggers, sealed ball bearings at all wear points and wide range of bu types are typical advantages.

CONTRACTORS AND ENGINEERS

New rig halves sawing time

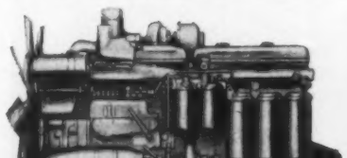
A Clipper Model C-560, cutting longitudinal joints section of new highway Mich. Behind the saw is a tank truck for supplying blades; on the next job, the expects to have the rig tow a lon tank. The frame does not saw; it merely allows the keep on the center line.



A contractor-built water jet connects to the water line at the rear of the saw. The jet helps clean the joint of the wet concrete dust.

A new concrete saw cut sawing time in half for making the center-line

Three new International TD-25's of contractor V. E. Posey's fleet team up preparing home sites from a mountainside...near San Diego, California. One "25" operator comments: "The power is there, but big engine 'sound and fury' are just about gone!"



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When the center-line joint is dry and blown out, a cold asphalt seal is applied. A Schramm compressor on the Ford powers the Lincoln pump that brings the Allied Asphalt Products cold seal through the hose.

to Sargent Construction Co. was about $7,000.

Good speed without trying

On this job, the contractor didn't try to push the rig to peak production. The maximum cutting speed of 35 fpm would have worn down the blades too fast. The machine easily cut from 700 to 800 feet per hour. At this speed, one of the Clipper 12-inch diamond blades lasted for about 3 miles on half the depth of the cut. Actually, the lead saw took the cut down 1¼ inches, and the follower saw cut the lower ¾ inch to complete the 2-inch joint. The width of the cut was slightly over ⅛ inch.

Hauls own trailer tank

Designed for maximum efficiency, the Model C-560 is built to haul its own water-tank trailer. On this project, however, Sargent was using a 3,000-gallon tank truck to follow the saw. On the next job, it expects to have a 1,000-gallon trailer tank for the saw to pull. Although the tank will have to be filled occasionally, the trailer tank will eliminate most of the labor cost of the driver on the tank truck. This will cut labor costs about in half.

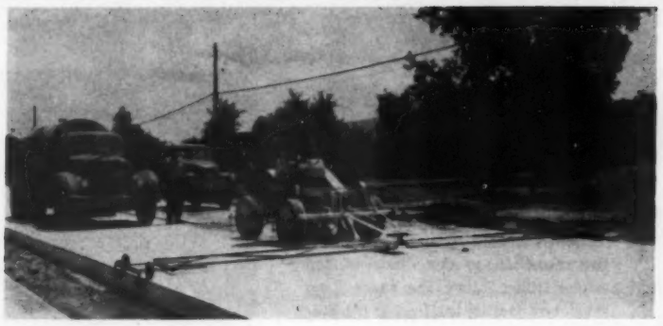
To improve cleaning of particles of concrete from the joint, the contractor added a small water jet at the rear of the machine. A hand faucet connection tapped the water from the main supply line. The stream of water was directed to the joint from a ⅜-inch copper tube that tapers at the end.

Blow and seal

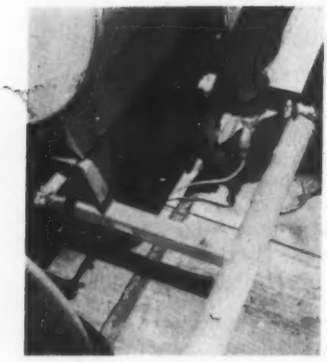
According to state specifications, a contractor must wait seven days before cutting the center-line joint. After the joint was cut and dried out, it was blown out with air to remove any dirt or other foreign matter. A cold seal was then applied. The seal was covered with a 2-inch strip of Sisalkraft paper.

Transverse joints formed

New rig halves sawing time



A Clipper Model C-560, [illegible] cutting longitudinal joints, [illegible] section of new highway [illegible] Mich. Behind the saw is a [illegible] tank truck for supplying [illegible] blades; on the next job, the [illegible] expects to have the rig tow a [illegible] ton tank. The frame does not [illegible] saw; it merely allows the [illegible] keep on the center line.



A contractor-built water jet connects to the water line at the rear of the saw. The jet helps clean the joint of the wet concrete dust.

A new concrete saw cut sawing time in half for making the center-line joint on a paving contract near Saginaw, Mich.

To save money and speed production, Sargent Construction Co., Saginaw, replaced its two 36-hp saws working in tandem with one specialized rig. Their Clipper Model C-560 longitudinal saw bites through the pavement at about twice the speed of the two smaller saws. Where it used to take most of the day to saw through a day's production (2,800 feet), it now takes only half a day.

Eight miles to cut

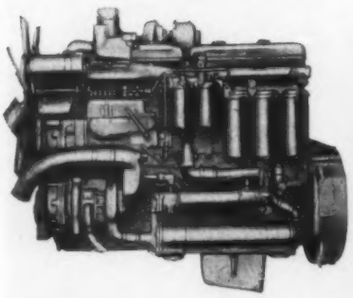
The construction company put the double-bladed saw to work for the first time on a 4-mile paving contract on State Routes M46 and M47 about 5 miles west of Saginaw. Since the roadway held four traffic lanes, there was about 8 miles of center-line joint to cut. The limestone aggregate in the concrete favored the sawing.

One-man saw

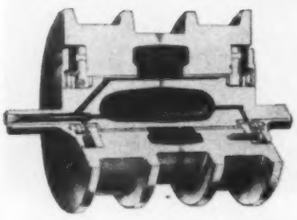
The new saw is designed specially for sawing longitudinal joints. It is operated by one man. From his seat on the rig, he controls the depth of the two cutting heads, the speed of travel (from 0 to 35 fpm) and the steering. His steering is guided by an indicator on a rolling frame that straddles the pavement. At all times, he can check the depth of the cut from a gage mounted on the machine.

Power from a Wisconsin 56.5-hp engine drives the front wheels, as well as the two saws and the water pump. The rig is driven by the front wheels and steered by the back. With a 14-inch diamond blade, the maximum depth of cut is 3⅜ inches. With an 18-inch blade, the maximum cut is 5⅞ inches. The cost of the machine

Three new International TD-25's of contractor V. E. Posey's fleet team up preparing home sites from a mountainside... near San Diego, California. One "25" operator comments: "The power is there, but big engine 'sound and fury' are just about gone!"



Big power "plus" of the new TD-25 is the new direct-start, 6-cylinder turbocharged International DT-817 diesel engine. Tri-metal crankshaft bearings; valve rotators; dry-type air cleaner; externally-mounted, gear-driven oil and water pumps—all are typical DT-817 long-life, high-output features!



How you get full[illegible]

Thick-shelled International Dura-Rollers have king-sized lube [illegible] voirs, positive sealing, and exclusive relief-passage protection from [illegible] lubrication. These *minimum maintenance* track rollers give you [illegible] 1,000-hour lubrication intervals!

Keep full loads on the move full time with exclusive Planet [illegible] steering. Full power on both tracks, full time, is the answer! And [illegible] on-the-go power-shifting lets you match power to condition, instantly, [illegible] keep loads "on the move"—and increase speed where practical! This "[illegible] belongs to Berke Moore Co., Inc., Boston expressway contractor!

When the center-line joint is dry and blown out, a cold asphalt seal is applied. A Schramm compressor on the Ford powers the Lincoln pump that brings the Allied Asphalt Products cold seal through the hose.

to Sargent Construction Co. was about $7,000.

Good speed without trying

On this job, the contractor didn't try to push the rig to peak production. The maximum cutting speed of 35 fpm would have worn down the blades too fast. The machine easily cut from 700 to 800 feet per hour. At this speed, one of the Clipper 12-inch diamond blades lasted for about 3 miles on half the depth of the cut. Actually, the lead saw took the cut down 1¼ inches, and the follower saw cut the lower ¾ inch to complete the 2-inch joint. The width of the cut was slightly over ⅛ inch.

Hauls own trailer tank

Designed for maximum efficiency, the Model C-560 is built to haul its own water-tank trailer. On this project, however, Sargent was using a 3,000-gallon tank truck to follow the saw. On the next job, it expects to have a 1,000-gallon trailer tank for the saw to pull. Although the tank will have to be filled occasionally, the trailer tank will eliminate most of the labor cost of the driver on the tank truck. This will cut labor costs about in half.

To improve cleaning of particles of concrete from the joint, the contractor added a small water jet at the rear of the machine. A hand faucet connection tapped the water from the main supply line. The stream of water was directed to the joint from a ⅜-inch copper tube that tapers at the end.

Blow and seal

According to state specifications, a contractor must wait seven days before cutting the center-line joint. After the joint was cut and dried out, it was blown out with air to remove any dirt or other foreign matter. A cold seal was then applied. The seal was covered with a 2-inch strip of Sisalkraft paper.

Transverse joints formed

In Michigan, the more critical transverse joints are not sawed; they are formed. On this job, strips of foam plastic, a lightweight plastic often seen in Christmas decorations, was used. The strips were bladed by hand into the concrete behind the last finishing machine.

After the shoulders of the road were finished, the strips, which are not re-usable, were ripped out of the concrete. The joint was then sandblasted and given a hot seal.

Personnel

Jack Byrnes was the superintendent on the job for Sargent Construction Co. The assistant superintendent was Wallace Eschenburg. James Beatty was the resident engineer for the Michigan State Highway Department.

THE END

...full-load turns...full-speed cycles

with proved TD-25 standard equipment!

As standard equipment at no extra cost, the new 230-hp TD-25 gives you the International® proved control combination that has been outproducing king-sized clutch-steered crawlers for years!

You get combined Planet Power-steering and Hi-Lo on-the-go, power-shifting exclusively in the new International TD-25. And you get this basic, built-in design advantage in your choice of torque-converter or synchromesh model!

With this and all its other big advantages, the TD-25 can outearn other big rigs up to 50%—on push-loading, bulldozing, or pulling big drawbar tools such as a shale-shattering ripper!

No "dead-track drag" or "gear-shift lag"!

Planet Power-steering gives you full-time "live" power and traction on both tracks, to make full-load turns—and to eliminate load-limiting "dead-track drag." And Hi-Lo on-the-go power-shifting instantly matches power to conditions to end load-losing "gear-shift lag."

Hi-Lo power-shifting makes the TD-25 the industry's only king-sized 4-speed torque-converter crawler, and the only one with load-matching efficiency-range control. In the synchromesh transmission "25," the Hi-Lo planetary system gives eight speeds forward and reverse. Either model gives you cycle-speeding, up-or-down, on-the-go power-shifting with "finger-tip" ease!

Power-shift and power-steer the new "25" with king-size loads—around curves, upgrade, anywhere. Prove what it means to command full-time, full-load ability to outearn clutch-steered king-sized crawlers, up to 50%—and with standard control equipment! Compare simplified TD-25 design—the only planetary system engineered and located to give you "live track" power steering and on-the-go, up-or-down power shifting! See your International Construction Equipment Distributor for a demonstration!

International® Construction Equipment

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Bituminous paving group elects new president

■ Bryant M. Collins, president of the Collins Construction Co., Austin, Texas, was elected president of the National Bituminous Concrete Association at the annual convention held early last month in Detroit.

The other 1960 officers elected at the convention include vice president F. C. Leffingwell, Asphalt Paving Co., Miami, Fla.; treasurer Allen Snyder, Hefler-Snyder Co., Garwood, N. J.; and secretary Stan Watkins, Bituminous Surface Treating Co., Inver Grove, Minn.

A 5-year, $1.3 million research program was instituted at the meeting. This is the first time that a group of paving contractors has undertaken its own research instead of leaving it to the government.

←For more facts, circle No. 270

TO SUPPLY FRESH AIR to workers constructing the upstream power tunnels at Oahe Dam in South Dakota, 30-inch-diameter Neolon ventilation tubing (upper right) is being used. Additional lengths are coupled to this one as tunneling progresses. This view of Tunnel No. 1 shows the general arrangement of the service area behind the "mole." At left is the boom of an Austin-Western beam hoist; top, background, a Louden monorail; right, foreground, a Barber-Greene transfer conveyor; and right, background, a Goodman rope conveyor. On the railroad track is fallout grout equipment.

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For more facts on [illegible] use coupon or circle No. 27[illegible]

Plastic buried 10 years still in good condition

Tests in the Bureau of Reclamation's Engineering Laboratories in Denver, on a variety of plastic canal-lining materials, some of which had been buried in soil as long as 10 years, indicate that the materials are in very good condition, without any significant chemical or physical changes.

The tests were made to help reduce the costs of canal-lining construction on BuRec's water-resources development projects. It has been indicated that the materials may be installed as buried linings for as low as $1 per square yard in many instances.

Some 60 plastic materials obtained from 15 manufacturers were studied. Because the canal linings are in contact with moist soil and subject to attack by bacterial and microorganism action, a composted soil was prepared. The soil was placed in metal containers coated on the inside with asphalt cement. To accommodate the 6-inch-long plastic specimens, the soil was placed to approximately 7 inches deep. Moisture content was kept at the optimum for microorganism activity, which is between 25 and 30 per cent. Temperature of the room in which the samples were stored was maintained at 100 degrees F.

When the samples were removed from the soil, most of them were found to be in excellent condition and were very pliable. Tensile strength was virtually unaffected.

Prefab building system developed by the Corps

Prefabricated buildings, featuring interchangeable components, have been developed by the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. With the use of the components, three different types of steel buildings—barracks, shops, and warehouses—can be elected by unskilled workers. The same purlins, roof sheets, doors, and windows fit all structures. The barracks' roof beam and high column are used intermediately in the warehouse.

The principal building of the family is the barracks, a 20-foot-wide structure that can be erected in 10-foot modules. Two of the 20-foot single-slope-roof buildings can be erected to form a 40-foot-wide building, or a 10-foot-wide extension can be joined to the 20-foot buildings.

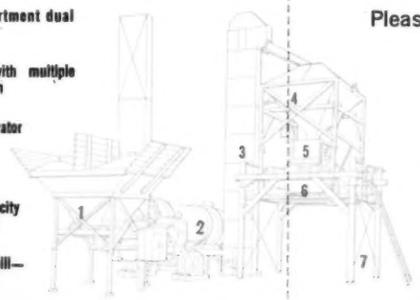
The warehouse is 40 feet wide with a center row of columns and is erectable in 20-foot modules with a 12-foot clear height for end and side-door entrance. Erection time for a 40×100-foot structure is 500 man-hours.

The shop building is 40 feet wide clear span and built in modules 10 feet long. The framing bent is rigid frame and the building wall height 20 feet clear inside. The shop is provided with end doors 20 feet wide and 16 feet high to permit entrance of railway equipment. Erection time for a 40×100-foot shop is 650 man-hours.

All buildings are of steel frame. Floors are of plywood; the insulation is Fibreglas; and the liner is Masonite.

The rugged Littleford Asphalt Plant is built to do the job . . . gives big plant quality mixes at small plant costs. Savings of 40% on producing bituminous black top are possible because you control the mix from pugmill to pavement. No more costly delays and waiting for trucks to arrive with the hot mix . . . with the Littleford Model 121-30 you have a plant with the flexibility and versatility to produce all types of black top mixes at the lowest possible cost. Only the Littleford Plant incorporates so many new and improved designed features and offers such a complete line of auxiliary equipment for you to custom-make a plant for your operations. You receive all the profits with **A LITTLEFORD MODEL 121-30 ASPHALT PLANT.**

1. 5-ton, 2-compartment dual feeder bin
2. 30-ton dryer with multiple flight construction
3. Enclosed hot elevator
4. Storage Hopper
5. 10 cubic foot capacity Batching Hopper
6. Twin Shaft Pugmill—1000 lb. batch
7. Self-elevating platform



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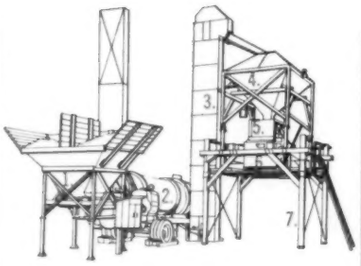
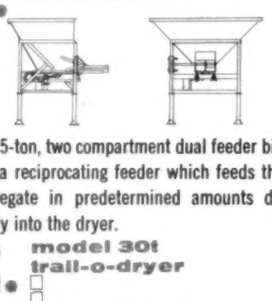


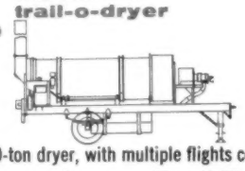
The Littleford plant incorporates many new and improved designed features that are not found on any other plant of this size. No other plant has the complete line of auxiliary equipment for you to custom-make a plant for your operations . . . you receive all the profits.

1. model 5-t-25 dual feeder bin



The 5-ton, two compartment dual feeder bin has a reciprocating feeder which feeds the aggregate in predetermined amounts directly into the dryer.

2. model 30t trail-o-dryer

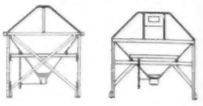


The 30-ton dryer, with multiple flights construction, produces an "Even-Veil" of aggregate across the drum permitting quick drying, and heating of the aggregate. The combustion area is constructed of tough, heat resistant "Cor-Ten" steel. Fuel oil or gas burner available.

3. model he-30 hot elevator

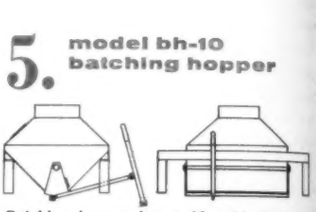
The enclosed hot elevator delivers a continuous cascade of hot, dry aggregate from the dryer to the storage hopper at a rate up to 30 tons per hour.

4. model sh-100 storage hopper



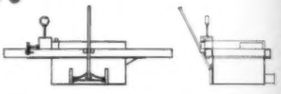
Storage hopper holds and discharges dry aggregate into batching hopper.

5. model bh-10 batching hopper



Batching hopper has a 10 cubic foot capacity (1,000 lbs.) for measuring one batch for the pugmill. Weighing scales available if desired.

6. model pm-10 pugmill



The twin shaft pugmill equipped with adjustable paddles is positioned directly below the batching hopper. An asphalt flow meter determines the correct amount of asphalt pumped into the pugmill.

7. model ep-30 elevating platform

The self-elevating platform permits discharging of bituminous black top directly into waiting trucks.

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Prestressed-concrete pipe being used on Israeli jobs

Prestressed-concrete pipe sections, for a line that will deliver water to the arid southern part of Israel, are being unloaded by a Cat tractor. One of the lines in the huge water-development project calls for prestressed-concrete sections 108 inches in diameter.

Some of the largest prestressed-concrete pipes in the world—each with a 108-inch diameter and weighing 30 tons—are being made to tap the Jordan River in Israel.

They are produced at the Yuval-Gad pipe factory set up seven years ago in a new city on the site of Ashkelon by the Lock Joint Pipe Co., East Orange, N. J.

The first pipes made there were for a project on the Yarkon River, which rises in the center of Israel and flows into the Mediterranean. Israel's irrigation master plan required the diversion of half its water for over 100 kilometers to the south to areas which had not been cultivated for many centuries.

Producing pipes

Rechanneling half a river was made possible by the prestressed-concrete pipes. Reinforced-concrete pipes were prohibitively expensive and far too heavy and bulky for Israel's light roads and single-track railway.

The first pipes made by the Yuval-Gad factory measured 66 inches in diameter and consisted of steel tubes lined on the inside with concrete. On the outside, steel wire with a working strength of 155,000 psi was wound under very high tension. Each pipe weighed 9 tons and was made horizontally, concrete being sprayed by centrifugal force into the pipe as it spun at great speed.

When it was decided to make the 108-inch pipe, problems were many. The factory's chief engineer was sent to the United States to plan the new pipes in consultation with American engineers. Machines capable of winding sufficient steel wire at high tension around the pipe had to be designed and made in America. An 80-ton crane was brought to Israel.

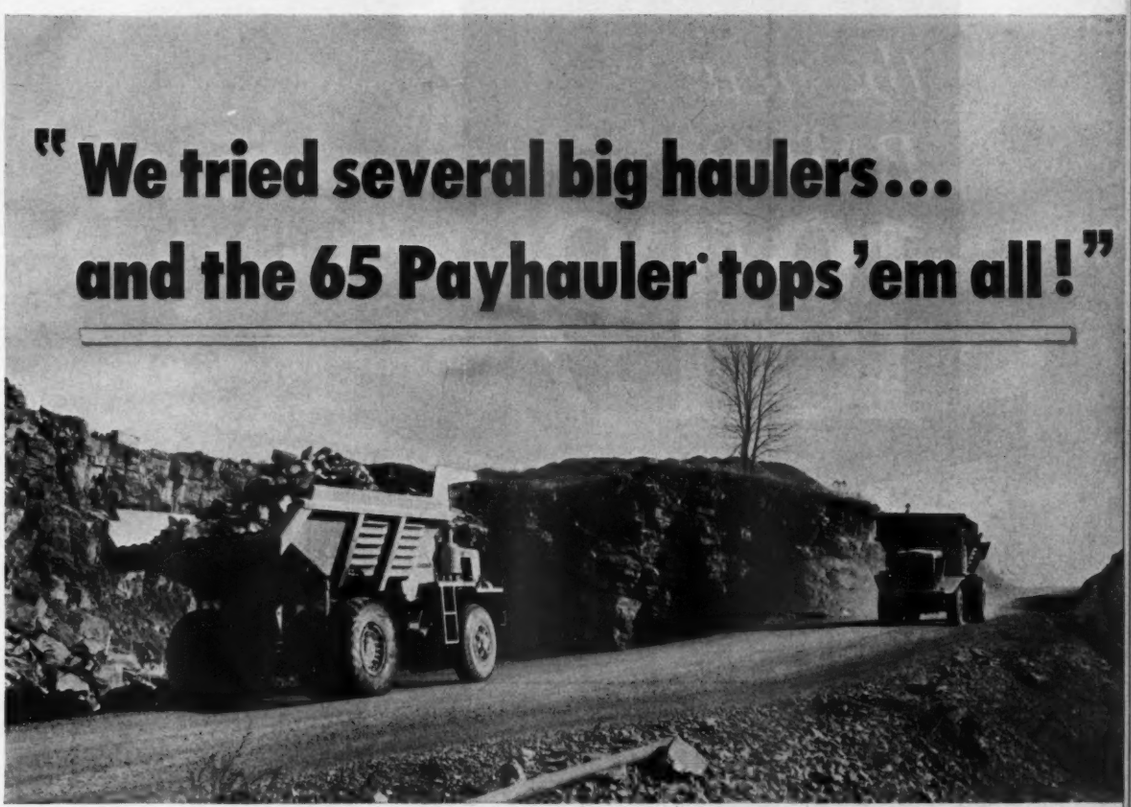
In order to make the 108-inch-diameter pipe, all equipment in the factory was virtually turned 90 degrees, and the pipes were manufactured vertically. The principles of the spinning pipe and centrifugal force had to be abandoned. Instead, molds were prepared and the concrete was placed from above on both sides of a steel tube, made of six sections electrically welded together. The new outer coat of concrete was added to prevent corrosion by cathodic currents. The steel wire around this coat, sprayed with mortar, completes the pipe. The factory produces 15 pipe sections, measuring 16 feet long and weighing 30 tons, per day. The first pipes have already been placed in position to form part of the pipeline of the Jordan River Project.

The first stage of the Yarkon River diversion has been completed with

(*Continued on page 35*)

For more facts, circle No. 273→

"We tried several big haulers... and the 65 Payhauler tops 'em all!"



—New Hope Crushed Stone & Lime Co., New Hope, Pa.

New Hope's "65's" speed full 19-ton loads of dolomite from quarry to 300-ton-per-hr. capacity crusher—with a maximum climb-out grade of 16% and an 800-ft. haul! The 250-hp "65" travels up to 36 mph.; the 375-hp "95" up to 38 mph.!

"Before buying two International® 65 Payhauler trucks, we had demonstrations by several large haulers," reports Edgar N. Putnam, for New Hope Crushed Stone & Lime Co.

"The '65' topped them all for production, ease of operation, and all-around efficiency. Main '65' features are ample power, balance for full-load delivery, and genuine operating ease and safety."

Both the 19-ton 65, and 27-ton 95 Payhauler trucks have the strength-multiplying International corrugated body design—that sheds weight, increases capacity. The direct-start International "817" engine super-powers both "65" and "95"—to outspeed former models, up to 40%. And both "65" and "95" highball full loads safely with reserve-area braking and new course-holding power-steering!

Compare—prove on the job that Payhauler gives you top off-road capacity; top power-to-weight ratio; top profit-earning ability! Let your International Construction Equipment Distributor demonstrate!

Get 11-second Payhauler dumping with exclusive inverted hoist body-positioning. Positive up-and-down snubbing control prevents machine-mauling dumping impact!

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Specifically designed to complete the line of BMCO self-propelled rollers, this new 18T9 boasts a ballasted weight of 18 tons with complete, independent oscillation on all 9 wheels.

Incorporating all the quality features, dependability and ease of operation of other BMCO rollers, the 18T9 is equipped with a torque converter, Revers-O-Matic transmission with four speeds forward and four reverse, power steering and power brakes.

Be sure to investigate BMCO before you invest in any compaction equipment — BMCO now producing the most complete line available — anywhere.

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(Continued from page 33)

the 66-inch pipes. The 90-mile-long line brings 900 million cubic feet of water to the badlands of the south. The Yarkon diversion called for three pumping stations, three operational reservoirs, and a seasonal storage reservoir.

The Yarkon River is tapped at its source in Rosh Ha'Ayin, where an earth-fill dam across the river diverts the flow and maintains a constant water level of 49.5 feet above sea level. The banks around the spring are lined with concrete to protect the water from vegetation; a peripheral channel, discharging below the dam, diverts surface water from the collecting area.

The three pumping stations provide a lift of 240 feet each in the first two stations and 180 feet in the third. All are underground. The water is delivered to the Qula operational reservoir, which has a 605,000-cubic-foot capacity, and then flows by gravity to the next pumping station. Here it is lifted to a second operational reservoir; flows by gravity to Gevim; is pumped to the third reservoir, which has a 1,800,000-cubic-foot capacity; and again flows by gravity to the Negev, Israel's southern area.

The first Yarkon line has cost to date $33 million, two-thirds of which was made available in grants and loans by the United States.

Kishon watershed

Far to the north, smaller pipes have annually brought 450 million cubic feet of water from the Kishon watershed to western Galilee. The Kishon River forms a natural drainage channel for the Valley of Jezreel.

The Kishon Project is aimed at collecting all the water resources in the area, including ground water, spring flows, and river flood water for redistribution through a 65-mile network of 48, 36, and 30-inch-diameter prestressed-concrete pipes. Wells were dug at strategic sites. There are three operational reservoirs with a total capacity of 585,000 cubic feet and a seasonal storage reservoir on the Kishon River at Kfar Baruch, with a capacity of 60,500,000 cubic feet. The investment of $10 million to date has made possible the distribution of a total of 450 million cubic feet of water per year.

THE END

Instrumentation van developed for Army

■ A mobile instrumentation van for recording the nature and effects of blasts in remote locations has been developed by the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

The van, designed to be used in areas where it would be impractical to provide permanent structures, has three groups of equipment. The first group measures shock waves in fluids and solids, and effects characteristic of small explosions; the second records general blast data; the third, using magnetic-tape recording equipment, provides an electrically reproducible version of the data obtained.

TEN MILES OF STREET CONSTRUCTION in the Hillcrest Heights of subdivision in the southeast section of Washington, D. C., starts as a Huber-Warco 6-D2 motor grader cuts the subbase to 8 inches below the curb. Six inches of bank-run gravel and a 2½-inch mat of hot-mix asphalt completed the streets.

After 20,000 hours of trouble-free power "Old Faithful" retired by new UDT-817!

An International UD-24 engine—called "Old Faithful" by her owners—has racked up 20,000 hours of continuous trouble-free performance on a rock crushing job in Kansas. That's an average of nine hours per day for six years! At 13,000 hours a gasket had to be replaced, but there have been no major repairs. The operation, owned by Roy Baker of Valley Falls, produces 900 cu. yds. of crushed rock daily with a 32 x 40 Universal crusher.

Partners in the company, Mike and Bert Baker, say, "We decided to retire our old faithful UD-24 after it had piled up nearly 20,000 trouble-free, hard-working crushing hours. The new UDT-817 was chosen because of its greater power, direct starting and easy installation. Fuel consumption on the 817 is low, considering the power we get. And with all that power we can eliminate secondary crushing by just reducing the jaw opening."

Roy Baker says, "Of course I bought another International!" And that about sums up the attitude of contractors all over the country—they know from experience that Internationals stand up under heaviest work, are immune to dust and grit—and will pay back the investment faster than any other.

Check with your International Engine Distributor or Dealer soon, and find out how little it costs to power—or repower—your equipment with International engines. See the full line of engines and power units—16.8 to 385 max. hp.

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For more facts, use Request Card at page 18 and circle No. 275

Big pipeline project geared for high speed

by BILL ALLEN, field editor

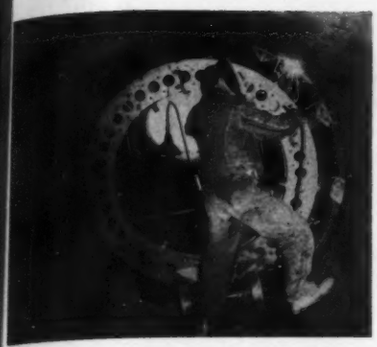
(Additional photo on front cover)

Rather than trench with a slow-moving truck-and-shovel operation, the contractor worked three Euclid TS-24 scrapers, pushed by a D9, to move from 2,500 to 3,000 yards per day. Here, the trench is squeezed between a busy highway on one side and a single railroad track and power line on the other.

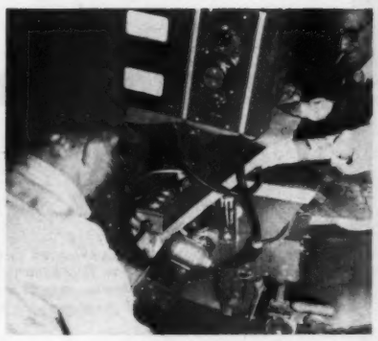
After scrapers have cut out the trench to approximate grade, 8-inch steel road forms are set to form the work slab. A Trailgrader, pulled by a Cat tractor shovel, shaves the clay to final grade. After this, a layer of reinforcing is laid. Concrete will be placed to a 4-inch depth; at the outer edges it will be 8 inches thick.

A Koehring paver drops concrete, and a screed pulled by a D8 with shop-built side boom levels the mix. Two Jackson vibrators ride the screed; their heads are inserted into the mix by hand. The right-angle bend at each end of the screed is required to clear dowel steel. The concrete is simply cured under plastic covers.

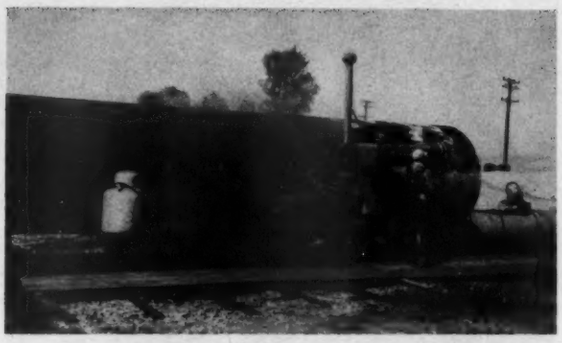
While the trench is being prepared, the 78-inch pipe is made ready. The subcontractor saved time and cash by having some work done in two yards along the route. The first step at a yard is placing 42-foot lengths of pipe on an inclined runway; this is done by a Lorain 35-ton crane with Ryerson tongs.



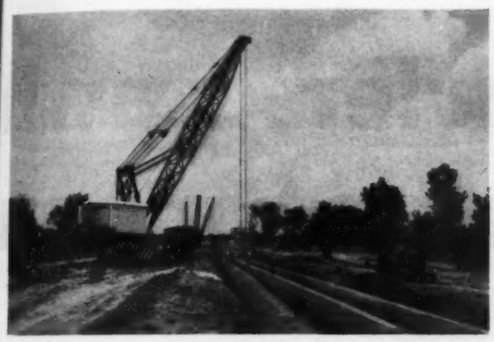
The first stop for the pipe is a tack-welding station, where ends of the sections are aligned with an M. J. Crose alignment clamp and then tack-welded together. The 84-foot length then goes to another station in the yard.



At the second stop, the bevel joint is completely sealed by a Lincoln automatic welder as the sections are slowly rotated. The welder remains on the "bottom" of the pipe as the section is rotated.



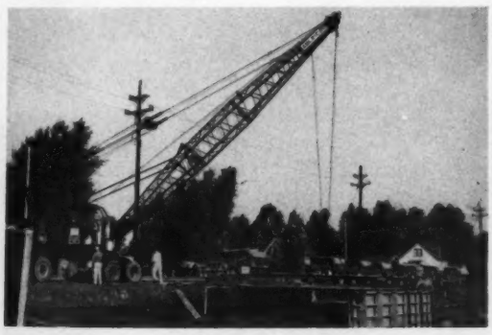
The 84-foot length rolls to this cleaning station, where the rotating steel brushes of the CRC cleaner clean the rust and dirt from the outside. The pipe is rotated as the cleaner moves forward on tracks. An International 549 butane-powered engine drives the cleaner. The pipe is either stockpiled or loaded to a truck for the haul to the trench.



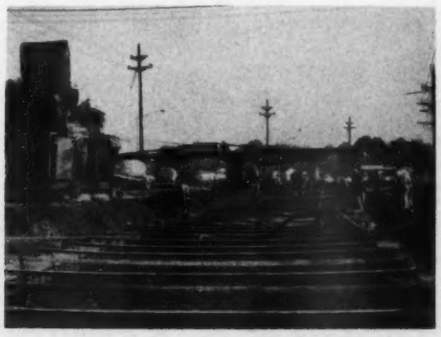
The 84-foot sections are set in the trench by a Lorain MC-760 60-ton crane. Pipes rest on 2-inch blocks of concrete set on the work slab. The lengths are welded together from the inside, a bevel weld and backup plate being used. Portable Lincoln welding machines on the bank furnish electricity for the field welding.

The Lorain's four Power-Set outriggers are set in less than 60 seconds. Quick setup time made it possible for the rig to be moved hourly. The yard crane was similarly equipped.

Once the three 78-inch lines are in place, they are enclosed with a single layer of reinforcing steel. Men walking the big lines set the individual bracket-shaped bars in position so that the ends can be wired to dowels in the base slab. Just behind this operation comes the encasement job.



Blaw-Knox steel form sections are set by an American 599 crane. Sections are 30 feet long, 7 feet high, 21½ feet wide. They are held at the bottom by bolts screwed into inserts in the slab, tied at the top with long steel angles, and held at the ends by a bolt and three slip-in pins.



Two Koehring 34-E's team to finish encasing the pipes. The lead paver first pours grout over the work slab for a better bond. Then pavers drop the 4½-sack mix to the forms. Jackson vibrators consolidate the concrete. Water is being removed by the Gorman-Rupp pump.

Backfilling is done by an A-C HD-21. Project manager was L. Lefler. F. Brady was super for Williams. For the Water Division, E. Easterday is chief engineer, design-construction; W. Thomas, project engineer; W. Danzer, resident engineer.

The job was big. Working conditions were rough. Production was high. That about sums up the work on the triple 78-inch line to carry water from the Chain of Rocks filter plant for the city of St. Louis.

This was a big project. Some 19 miles of 6½-foot-diameter steel pipe had to be set in the ground and encased in concrete. About 4 miles of the trench was wide enough to contain three parallel lines. The remaining 3½ miles of trench holds a double line of pipes.

Problems were many and tough. For much of its length, the 24-foot-wide trench is squeezed between power lines and a railroad track on one side and a busy highway on the other. Room for operating heavy equipment was severely limited. Work was also hampered by the need to maintain traffic on streets crossing the trench.

In spite of difficult conditions, the triple line was encased in concrete at an average rate of about 450 feet per day. It was not unusual to make 900 feet in a 10-hour day. As evidence of the high production, the contractor received the biggest check ever written by the city of St. Louis for a month's work—$979,430 for October, 1959.

The combined efforts of two contractors were responsible for finishing the big project a year ahead of schedule. Working under a $3.6 million general contract, Fred Weber, Contractor, Inc., of St. Louis handled the excavation, concrete work, and backfill. Working under a subcontract from Weber, Williams Brothers Co., Tulsa, Okla., welded the big pipe and set it in place. The Water Division of the city of St. Louis designed the main and supervised construction. Cameraman Bill Allen shows how Weber's job and Williams Brothers' pipe-welding operations, in the field and in the yard, were geared for high production.

Deep cuts and high

Pioneering is rough for the new road over Rabbit Ears Pass in the Rockies, near Steamboat Springs, Colo. The TD-24 tractor, making a start on one of the extremely big fills, is stripping the lower part of the area. Even getting a dozer down the mountainside to the toe of the slope was difficult in spots like this.

Cat crawler-drawn
short work of mean

Deep cuts, high fills, and steep mountainside grades were everyday fare for Amis Construction Co., Oklahoma City, on the grading of the new road over Rabbit Ears Pass in the Rocky Mountains east of Steamboat Springs, Colo. Amis has completed two successive grading contracts totaling more than $4.3 million and extending 7.698 miles up the west slope of the mountain.

The new road follows the general location of old U. S. 40, but it transforms the tortuous hairpin turns into a series of smooth, easy curves on grades from a minimum of 5.8 to a maximum of 6.985 per cent. The project was planned and supervised by the Colorado Department of Highways.

Upon completion of the several grading contracts, the roadway will be surfaced with bituminous pavement to a width of 36 feet to provide two uphill lanes and one downhill lane. The finished grading section is 58 to 60 feet wide with cut slopes of 1 to 1 and fill slopes of 1½ to 1.

The new alignment, clinging to the edge of the mountainside, slashes through high ridges and across deep canyons. The result is a succession of deep cuts and high fills.

In one case, a cut 146 feet deep occurs directly adjacent to a 185-foot fill. The scrapers starting from the top of the cut dropped down 331 feet to start the fill. Yet the center-line distance between the high point of the cut and the toe of the fill was less than 1,000 feet. In another instance, a slope stake indicated 120 feet of cut one side of the roadway, while the other side daylighted.

Pioneering is tough

Pioneering these cuts and fills was a fantastic operation. Tractor-dozers worked their way up and down the steep mountainside, sometimes going a roundabout way, to reach the starting points. Then they scratched away the soil and loose rock, bit by bit, to flatten off an area where other machines could work. Often, the pioneering tractors had to move a considerable amount of material to open the cuts and fills and build the necessary access roads.

If the material was dirt or loose rock, rippers and scrapers followed the pioneers. It was not uncommon to see a tractor pushing a scraper up the mountainside to the loading point, and then pushing it back down again

...ake for spectacular grading

...ctor-mounted drills prepare

...st holes as shovels and

...pers move rock and dirt

Joy Challenger units and Joy 600-cfm compressors, on an International TD-24, left, and an Allis-Chalmers HD-19, drill holes an average of 20 feet in this cut for loading with explosives.

...Scrapers make ...mountain hauls

A canal across a mountain! That's the job this contractor's doing in Colorado. Brannon Construction Co. is building an irrigation canal from Vega Dam near Collbran to agricultural areas 18 miles away. To make the mountain job even tougher the canal path is mostly rock. Hauls are short—1000 feet maximum. There's little room for turning.

Brannon Construction got set for the job with a spread of three Caterpillar D8 Tractors, two No. 90 Scrapers, a D9 and a D7. A Cat No. 12 Motor Grader—used for sloping the canal sides—completes the spread.

Each D8 pulls a No. 90 Scraper, while the D9 backs them up with its mighty pushloading force. The D7 dozes and pulls a sheeps-foot roller. This efficient spread moves about 4500 yards a day. Even with tricky mountain maneuvering, scrapers make 5 to 6 minute cycles.

This application is another demonstration of the efficiency of crawler-drawn scrapers—on the short hauls, for the rough ground and underfoot conditions that are mean and tricky.

This is exactly the kind of going that Cat crawler-scraper combinations can convert to high production. They're self-loading or, for even higher production, they can be pushloaded. And with the added brawn of recent improvements, Cat crawler-drawn Scrapers haul bigger loads, last longer. Your Caterpillar Dealer has four-wheel Scrapers to match the D9, D8, D7 and D6 Tractors and to fit different hauling needs. And he has the tractors to match any job that comes your way! New 335 HP D9 Series E . . . the new D8 Series H—up 44 HP to 235 . . . the 140 HP D7 Series D. See your Cat Dealer for the quality equipment . . . before you bid on your next tough job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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BORN OF RESEARCH
PROVED IN THE FIELD

POWER SHIFT TRANSMISSION MAKES THE D8 AND D9 EVEN MORE NIMBLE

Shift on-the-go under full load in a split second. No more clutching. Shift in a single motion with a flick of the selector lever. Even when conditions are as tough as those above, operators will move more dirt with the new Cat power shift transmission.

to load. The scraper would make its own way down the grade to dump at the bottom of a fill area, but would then have to be pushed back up the steep access road out of the fill. This was slow and dangerous work.

Drills mounted on tractors

In some cuts, the pioneering tractors could cut out only a small bench before getting down to solid rock. In other cases, the scrapers were able to remove quite a bit of dirt and loose rock before reaching outcroppings that were too hard to rip.

When the hard rock was exposed, tractor-mounted drills moved in to prepare for blasting. Two of these were Joy Challenger drills and compressors on International TD-24 and Allis-Chalmers HD-19 tractors. The other two were Gardner-Denver wagon drills and compressors mounted on Cat D7 and D8 tractors.

Holes were usually drilled on a 10×10-foot gridiron pattern to a depth of 20 feet. The holes were loaded with ammonium nitrate, with one stick of Atlas 60 per cent dynamite added per hole. Average shots yielded about 2 cubic yards of rock per pound of explosive. Because of the lack of uniformity of the partially disintegrated granite, it was difficult to get perfect fragmentation, and some fairly large chunks had to be handled.

Three Northwest 80-D shovels loaded the rock into a mixed fleet of haul rigs that included Euclid end-dumps, International Payhaulers, and

An Athey PR21 dump wagon and Cat DW21 tractor unload rock for one of the high fills. The new road will wind down the mountain and into the valley several thousand feet below.

←For more facts, circle No. 276

Starting right on top of one of the mountain ridges, an International TD-24 tractor with pull-ripper scarifies partially disintegrated granite so that it can be loaded by scrapers.

With scarifying finished, a TD-24 push-tractor and Cat DW21 scraper move in to start the cut, which goes 146 feet deep. The adjacent fill is 185 feet high, making a difference of 331 feet.

After delivering its load in the fill area, the DW21 has to be pushed by a TD-24 to get up the steep grade empty. This type of operation was not unusual along the mountainous alignment.

(*Continued from preceding page*)

Athey-Caterpillar PR21 rear-dump wagons. Of the 2.2 million cubic yards of material in Amis' second contract, approximately 75 per cent was rock, and this kept the shovels and haul rigs busy.

This second contract was scheduled for completion in 210 working days. In this mountainous area, a normal working season has about 130 working days. This put the crews under pressure to get the work done before snow brought operations to a halt. The previous winter, snow shut the job down early in November and kept it down until June. The snow reached a depth of 10 feet at the job shops near the high end of the project.

During the winter, Amis moved the rubber-tire equipment to jobs in Oklahoma and Texas. Tractors, shovels, and other heavy equipment remained on the mountain, and a small maintenance crew worked through much of the cold weather, overhauling the machines.

A partial list of the equipment used on the project includes:

- 3 Northwest 80-D shovels
- 11 Euclid 18-ton end-dumps
- 2 Athey PR21 rear-dump rigs
- 2 International Payhaulers
- 4 Cat DW21 scrapers
- 2 Cat 80 scrapers pulled by International TD-24 tractors
- 4 tractor-mounted drills
- 2 Cat D8 tractor-dozers
- 1 Cat D9 tractor-dozer equipped with ripper
- 3 International TD-24's
- 1 International TD-20
- 4 International TD-24 tractors
- 1 McCoy 6-foot tamping roller
- 1 Euclid water truck
- 1 Dart 4,000-gallon water truck
- 11 Hobart and GE light plants
- 1 Michigan 125A tractor shovel
- 2 Cat No. 12 motor graders
- 1 Adams 660 motor grader

Equipment maintenance

Working in rock under the rugged conditions of this job called for a lot of equipment maintenance to keep the big spread operating on a double-shift basis. Maintenance headquarters were located at a reasonably level spot near the high end of the job. Here a 30×60-foot metal shop building was set up, together with a welding shop.

MOTO-LOADER CARRIES AND PLACES 6,000-LB. MANHOLE PIPES, BACKFILLS 31-FT. TRENCH

With a 7000-lb. carrying capacity, this rugged Lorain Moto-Loader keeps on its toes to deliver triple duty performance. Hage Bros., Inc. of Owatonna, Minnesota, rely on the speed and stamina of their ML-157 Moto-Loader to place manhole pipes on a 71,000-foot sanitary sewer job.

Carries heavy pipe without bounce. The Moto-Loader's weight distribution eliminates bounce or teeter when carrying concrete pipe sections 4 ft. in diameter, 6 ft. long and weighing 6,000 lbs. Lorain puts the center of gravity down low where it belongs for ground-hugging travel.

Building steep grade roads takes balanced control. At 250- to 400-foot intervals, the Moto-Loader cuts a 100-ft. sloping road to the trench, carries the pipe, lowers it in place, and then backfills the road and trench. Control balance—featuring Lorain's One-Foot Travel Control—lets the operator combine many operations for faster work cycles, increased production.

Operator likes Moto-Loader's balanced power that matches hydraulic capacity, engine size and transmission of power to wheels for maximum tractive effort. No wasted horsepower, no wheel spinning—all the power works at the job.

Also available, the ML-153 with 6,000-lb. lifting capacity. See your Lorain distributor.

One-foot travel control boosts payloads . . . frees operator's hands for steering, bucket control and other operations. By pivoting his foot between two adjacent pedals, operator controls both forward and reverse travel and acceleration.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN. ON THE MOVE

PLANTS: In Lorain, Elyria and Bucyrus, Ohio . . . **PRODUCTS:** Power shovels, cranes, draglines, clamshells, and hoes on crawlers from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . **OUTLETS:** Lorain products sold and serviced by 249 distributor outlets throughout the world.

For more facts, use Request Card at page 18 and circle No. 277

NOW YOU CAN DRASTICALLY CUT YOUR HAULING COSTS

thanks to the BIG GMC BREAKTHROUGH in truck engineering

NEW GMC GAS ENGINES... PROFIT-PERFORMANCE ON EVERY HAUL		
Model	Gross Torque Range	Max. Horsepower
305A	258-260 @ 14-2200	150 @ 3600
305B	264-266 @ 11-2000	150 @ 3600
305C	268-270 @ 12-2100	165 @ 3800
351	308-312 @ 14-2400	180 @ 3400
401	375-377 @ 12-2000	205 @ 3200

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GENERAL MOTORS CORPORATION
TRUCKS

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General Motors leads the way!

GMC GAS ENGINES... P

Model	Gross Tor
305A	258-260
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305C	268-270
351	308-312
401	375-377

NOW longer-lasting, high-performing engines!

EXCLUSIVE NEW V-6

Life expectancy: 3 times longer! Completely new design, more compact and stronger! Actual tests prove these advanced V-6 engines can give you up to 200,000 miles of continuous operation without a major overhaul.

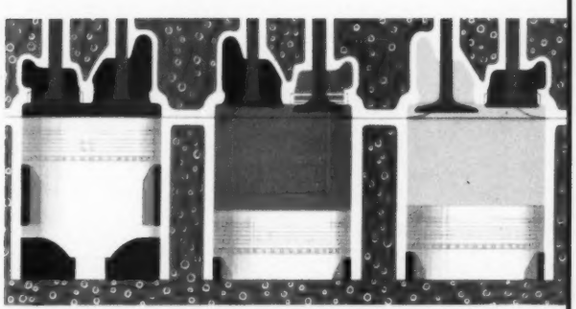
EXCLUSIVE NEW TWIN-SIX

Most power of any standard gas engine! Highest torque over a broader, lower, easy-stroking rpm range saves fuel, reduces engine wear and cuts shifting up to 60%.

Pistons are exclusively GMC designed and built for best sealing and longest life. Special casting with the head down assures more strength at the top where it's needed. 4-ring pistons have cast-in steel band to control expansion. All pistons are extra-heavy-duty design, yet every one is precision balanced to 1.8 grams for vibration-free performance, measured to .0003 inches for a perfect fit.

Massive, high-strength GMC connecting rods are drop forged, heat treated carbon steel. Every one is precisely balanced to less than 2 grams tolerance for smooth, lasting operation.

New, big-diameter GMC bearings last 7 times longer than others. M400 bearings will take the heaviest loads under the most extreme operating conditions.



Longer engine life with 33% more cooling area, 3 times more water volume than comparable engines! Notice the extra-wide water passages that completely surround each cylinder! See the widest spaced valves with the biggest cooling area for rapid heat dissipation! No two exhaust valves are adjacent! New high-volume water circulation (up to 176 gallons per minute) assures less than *4 degrees* temperature variation throughout. These are the most efficiently cooled engines with every feature to eliminate life-killing "hot spots".

NEW V-6 DIESELS

Most power per dollar! New high-performance, fuel-saving GMC Truck diesels have proved, efficient 2-cycle design with power on every downstroke to give you more power per dollar, more power per pound, more power per cu. in. displacement.

New 6V-71 engines have all the proved performance, economy and durability features of the famous 71 Series, the power plants that are so well known in the construction business . . . in trucks and heavy-duty service equipment.

Only GMC Trucks have this economy range governor that positively controls engine speed in top gears at most efficient point for outstanding fuel economy.

Simplest, most practical and durable, and least expensive diesel fuel system of all! GMC's precision-built injector meters exactly the right amount of fuel to each cylinder, times the injection and atomizes the fuel for most efficient burning . . . eliminates troublesome high-pressure lines and complicated pumps.

- GMC Truck diesels have *four* exhaust valves per cylinder (not 1 or 2) for complete scavenging of all gases and freer breathing.
- Automatically save up to 5% fuel, get up to 7% extra hp. with the standard, exclusive hydraulic fan.
- Up to 530 pounds lighter than comparable horsepower diesel engines.
- Cut costly downtime and expense with complete one-stop parts and service at every GMC Diesel Truck Dealer.

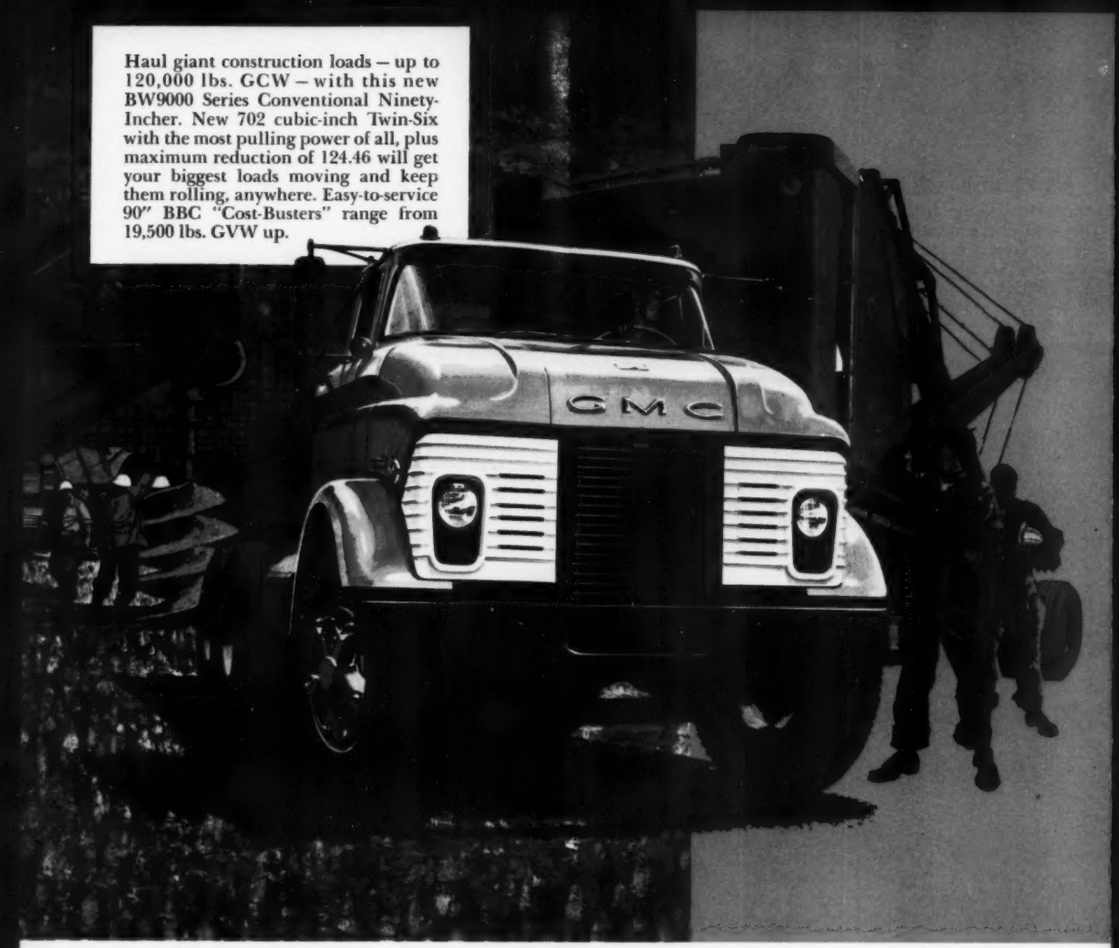
POWER-MATCH YOUR JOB WITH NEW GMC DIESEL POWER		
Model	Max. Torque	Max. Horsepower
6V-71	577 @ 1200	189 @ 1800 or 210 @ 2100*

*No extra cost

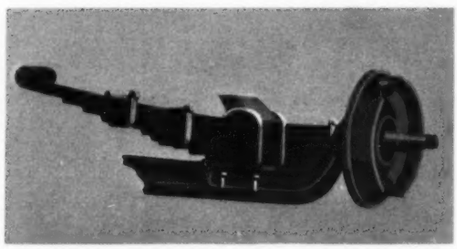
See the Yellow Pages for your nearest GMC Dealer . . . for actual comparisons that prove GMC Truck superiority.

MC GAS ENGINES . . . PROFIT-PERFORMANCE ON EVERY HAUL		
del	Gross Torque Range	Max. Horsepower
A	258-260 @ 14-2200	150 @ 3600
B	264-266 @ 11-2000	150 @ 3600
C	268-270 @ 12-2100	165 @ 3800
	308-312 @ 14-2400	180 @ 3400
	375-377 @ 12-2000	205 @ 3200

Haul giant construction loads – up to 120,000 lbs. GCW – with this new BW9000 Series Conventional Ninety-Incher. New 702 cubic-inch Twin-Six with the most pulling power of all, plus maximum reduction of 124.46 will get your biggest loads moving and keep them rolling, anywhere. Easy-to-service 90" BBC "Cost-Busters" range from 19,500 lbs. GVW up.



NOW you can cut job time, cut costs with



New, Stronger Front Suspension and Springs! New GMC heavy-duty models are easier to drive and last longer, too. You get increased stability, shorter turning and improved handling with longer-lived, wide-track I-beam front axles. New, longer, wide springs have more capacity, greater load-cradling flexibility.

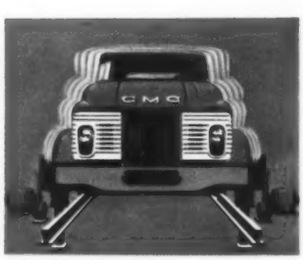
Bigger Payloads, Less Maintenance! With this new GMC tandem suspension you have less unsprung weight, less truck weight for bonus payloads. Rubber mounts and bushings at all wear points practically eliminate service. True alignment of axles and equal load distribution at all times increase tire and axle life.

You can mount up to an 11-foot body on a inch wheelbase, or practically *any* construct body on the new full line of GMC steel cab- Turning circles are short as 33½ feet. vision is the best you can get. Payloads ger with front axle set back 52 inches. of the 72" BBC cab cuts service time and co Choice of responsive V-6 and Twin-Six engines or new V-6 diesel.

Here is new, practical styling and uncompromising ruggedness...new GMC pickups with frames up to 100% stronger, V-6 power with 3 times longer life expectancy and stronger axles. There is extra stamina and extra value in every one of the 34 combinations, including "go anywhere" 4-wheel-drive models. Other 105" BBC Conventionals to 45,000 lbs. GCW. See them, drive them today.

job time, cut costs with the most advanced trucks in 20 years!

Bigger Payloads, Less Maintenance! With this new GMC tandem suspension you have less unsprung weight, less truck weight for bonus payloads. Rubber mounts and bushings at all wear points practically eliminate service. True alignment of axles and equal load distribution at all times increase tire and axle life.

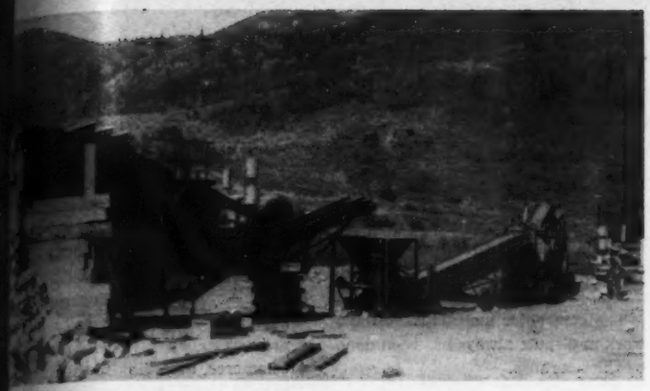


New GMC Double-Life Cabs! A man couldn't stand this "shake test" for 60 seconds, yet new GMC cabs can endure it for nearly two days . . . proof of superior construction and long life on every job.

Frames Up to 35% Stronger! Totally new design, new stronger and lighter materials make GMC Truck frames stand up under the constant tougher-than-normal construction hauling, permit you to carry bigger loads, too.

Longer Brake Life! You get a running, stronger and longe ing brakes with GMC's ne trifuse drums . . . bigger l areas give added lining li quick, safe stops.

GMC Truck & Coach—a General Motors Division—Pontiac, M



This crushing and screening plant was set up in a pit at the bottom of the grade in preparation for base and paving operations. At left is a Pioneer No. 152PR primary crushing unit with conveyors feeding into a Pioneer 35S duplex secondary unit. A GM 6-110 engine, extreme right, powers the secondary plant.

Parts trailers that flanked the shop building carried more than $50,000 worth of the most commonly needed parts.

Daily lubrication and servicing were handled by special crews working with two mobile lube rigs. Carried on Chevrolet trucks, the rigs were equipped with five Lincoln pumps and reels, Hobart generators for lights and power, Bendix-Westinghouse compressors operating from the truck engines, and emergency tanks of fuel and water. Texaco lubricants were used exclusively.

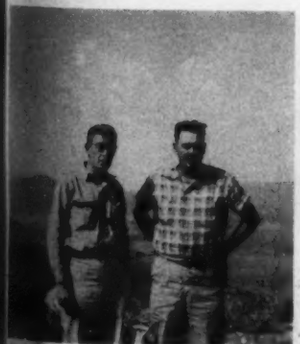
Working three men to a truck, the lube crews serviced most of the equipment in the breaks between shifts. Shovels and drills were serviced during the working hours of each shift. The maintenance and lubrication crews had a total of 33 workmen on the job.

Personnel

The operation was supervised for Amis Construction Co. by project manager Harold Wilkins and his staff, which included shift foremen Harold Cross and Max Butler and equipment superintendent Dudley Williams.

The resident engineer for the Colorado Department of Highways was Bob Heathcote. Chief engineer of the department is Mark U. Watrous. The staff construction engineer is W. J. Walsh, and the district construction engineer is Harry Demarest of Steamboat Springs. This job is under the supervision of district engineer Ralph McCoy of Grand Junction.

THE END



Bob Heathcote, left, resident engineer for Colorado, and Harold Wilkins, project manager for Amis Construction Co., Oklahoma City, pause during a tour of inspection of the grading operations.

Army Engineers develop air-borne crane-shovel that can lift more than 18,000 pounds

■ An air-borne crane that can be delivered by parachute in forward areas has been developed through a joint effort of the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va., and the crane-shovel industry to meet the need for lightweight, yet rugged, construction machinery.

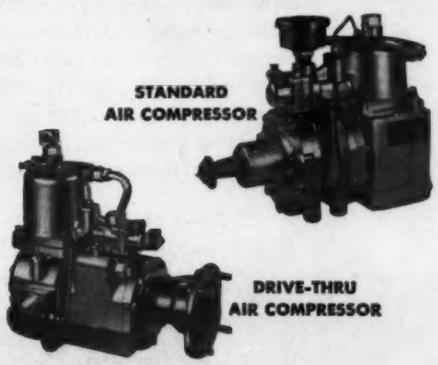
The crane not only is capable of being transported by air but is unique in that it is able to lift more than its own weight. This newest item of air-borne equipment weighs only 16,000 pounds, yet it has lifted more than 18,000 pounds in various tests. It can readily be towed at convoy speeds, has a self-propelled speed of 8 mph, and can be converted to ¾-cubic-yard clamshell, dragline, and shovel front operation.

The crane is equipped with a folding gantry and 3-piece boom. In preparation for air drop, the gantry is folded so that it is below the machinery housing and the boom is removed. The boom sections are light enough for handling by two men without the use of auxiliary lifting equipment. When the boom is removed, the total length of the machine comes to only 17 feet.

NEED MORE AIR RESERVE

for safer control of off-the-road equipment?

INSTALL Wagner Lockheed ROTARY AIR COMPRESSORS



You'll have plenty of air reserve for braking and control when you use Wagner Lockheed Rotary Air Compressors on your equipment. Rotary action, with four impulses per revolution instead of two, assures rapid pressure recovery—ample air reserve.

Rotary operation cools air in compressor and dome before it is discharged into the line. Low discharge temperature prevents carbon formation—reduces fire hazard—lets you use flexible hose for the discharge line. The smooth operation created by thousands of small, overlapping air compression impulses per minute increases belt and coupler life—eliminates severe shock to the drive train. The use of only two sleeve type bearing surfaces adds to compressor life. Bearings have steel-backed, babbitt-lined, renewable inserts.

Wagner Lockheed Rotary Compressors are available in either 9 C.F.M. capacity, air or water cooled; or in 12 C.F.M. capacity, water cooled. Also in a "Drive-Thru" type for diesel engines.

Complete Balanced Systems for your Equipment

Look to *one* source—Wagner . . . for complete braking systems . . . straight air or air over hydraulic. Wagner's wide variety of brake products includes power source, application units, and foundation brakes. REMEMBER, when ordering new equipment, be sure to specify Wagner Lockheed. Full details are yours in Catalog KU-201.

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Labor Review

Building trades negotiate average wage increase of over 14 cents hourly

Wage rates for organized building tradesmen throughout the country reportedly went up an average 14.3 cents an hour during 1959.

The 14.3-cent figure is the arithmetic mean derived from 731 reported contract settlements. Actual hourly increases ranged from 0 to 39 cents, with 15 cents the most popular figure, 10 cents next, and 12 or 12½ cents the third most frequently agreed upon first-year increase.

West Coast unions maintained their reputation for negotiating above-average settlements. Mean increase in the western states was 18.9 cents an hour, against the national average of 14.3 cents, and 20 cents appeared more often than 15 cents in individual settlements.

Health-welfare programs were provided in 57 per cent of the agreements, while pension programs were established or continued in 154 of the reported settlements, employer contributions for apprenticeship and training were called for in 50, vacations were mentioned in 57, and holiday pay was provided in 20.

Southern Illinois laborers and cement finishers settle with AGC

Laborers and cement finishers in Illinois Highway District 6 agreed with the Associated General Contractors upon wages for the next three years.

Cement finishers received an immediate raise of 10 cents an hour, with another dime due in January, 1961, and a final 10-cent increase in January, 1962. The initial increase establishes a $3.35 hourly rate for journeymen.

Laborers got 12½ cents an hour more, effective this past January. Wages will go up 10 cents more an hour in 1961 and another 10 cents in 1962.

Unskilled laborers in Adams, Schuyler, and Menard counties now are getting $2.65 an hour; in Brown, Pike, Mason, Cass, and Scott counties, $2.70; in Logan and Christian counties, $2.75; and in Morgan and Sangamon counties, $2.80. Semi-skilled laborers in all 12 counties receive $2.85 an hour, and jackhammer operators, cement handlers, and other skilled laborers get $2.90.

Operating engineers' strike in northeastern Indiana goes into another month

A strike by operating engineers in 33 northeastern Indiana counties entered another month with no indication of an early break in the impasse between employer and union negotiators over hiring provisions.

Neither the union negotiators, who were demanding an exclusive hiring hall, nor the employers, who refused to accede to the demand, reportedly had changed their positions.

An unfair-labor-practice charge by the contractors—that the strike was being conducted for an illegal objective—had not yet been ruled on by the NLRB general counsel.

Building trades picket tunnel project in job dispute

A demand that higher-paid crafts be employed for jobs now assigned to sandhogs led to intermittent picketing of a $29 million tunnel project at East Boston, Mass. The tunnel is being built for the Massachusetts Turnpike Authority by the Perini Corp.

Perini reportedly was using sandhogs at $2.65 an hour for work that was claimed by the iron workers, bricklayers, and roofers, whose pay scales range as high as $4.12 an hour.

The contractor maintains that the work in dispute always has been done by the sandhogs.

Clearing work not needed for dam construction ruled outside FLSA coverage

Site-clearing work which is performed primarily for recreational and health purposes, and which is not essential to the construction and maintenance of a dam built by the U. S. Army Corps of Engineers, does not involve a subcontractor in the production of goods for interstate commerce, according to the ruling

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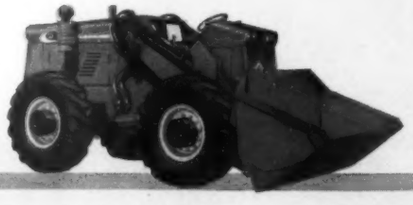
That extra foot or two of reach that you get with a TL-20 tractor loader makes a big difference in your output. You clip valuable seconds from work cycles by dumping loads right into the center of high-body trucks. No time-consuming loading from both sides . . . no pitching . . . no wasting time dozing to distribute material evenly—and no banging up truck and loader.

Other exclusive advantages include: *Faster Shifting*—one lever controls both forward-reverse and all speeds. *Greater Stability*—easier loading, less spillage, more operator comfort. *Strong, Pin-Connected Axles* prevent rolling and shifting of axles under load. Your Allis-Chalmers dealer can show you other tractor loader advantages that bring extra production on excavating and loading work. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

TL-20—6 buckets, from 2¼ to 5 cu yd • 130-hp diesel • 23,250 lb • 9,000-lb. carry capacity



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an Arkansas Federal District Court.

U. S. district judge John E. Miller refused to grant an injunction sought by the Secretary of Labor to force the Wade Lahar Construction Co., of Mountain Home, Ark., to pay certain overtime wages allegedly due its employees under the Fair Labor Standards Act.

The Secretary contended that the clearing activities were part of the over-all construction of the Table Rock Dam and Reservoir, located on the White River near Branson, Mo. It was claimed that Lahar's employees were engaged in commerce, in that the dam was designed to control water levels and thus affect the navigability of the lower White and Mississippi rivers, and in that the dam gave flood-control protection to interstate highways, railroads, power lines, and various communication facilities.

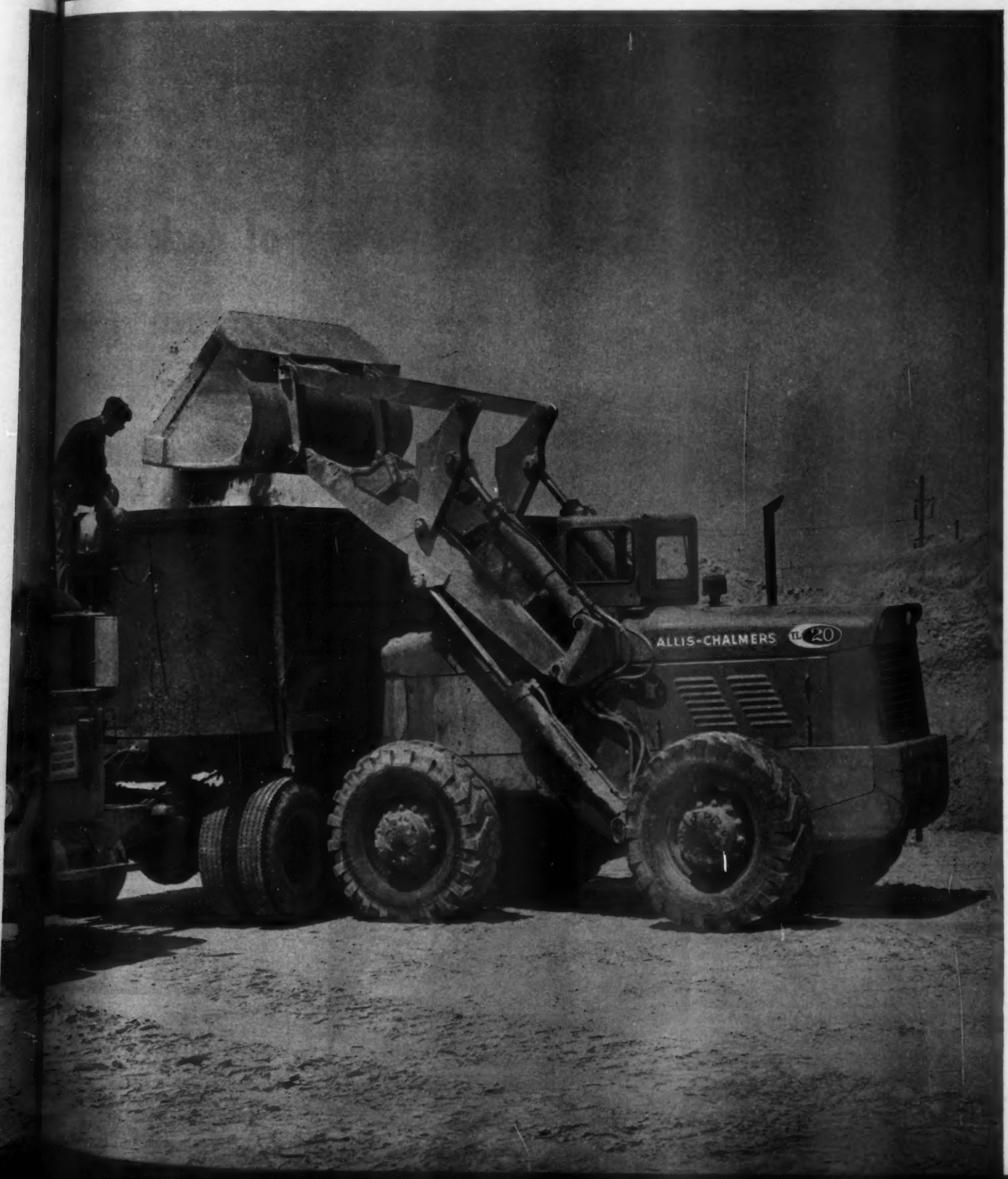
State-wide agreements being negotiated by Minnesota AGC

The Minnesota Chapter of the Associated General Contractors was in the midst of negotiations on new state-wide contracts with the operating engineers, teamsters, laborers, and carpenters. Three of the agreements expired December 31, 1959, while the teamsters' runs until May 1, 1960.

All of the contracts were of three years' duration and provided rates of $3.45 for operating engineers and carpenters, and $2.70 for teamsters and laborers.

Negotiations were also in progress with the cement masons on a new contract for the Twin Cities and surrounding counties.

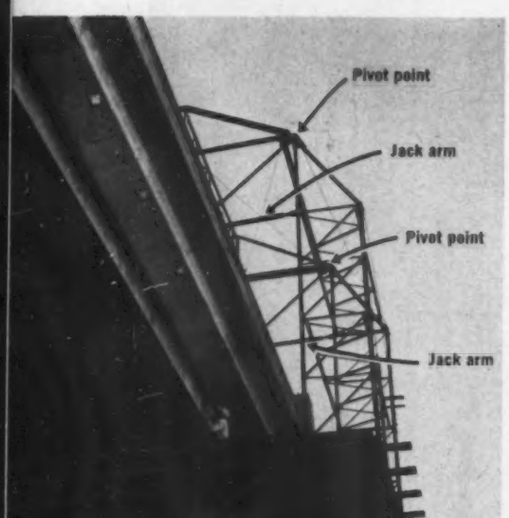
A spokesman for the AGC declined to say what offers and demands have been made but said there was no deadlock in the talks.



A traveling rig is used in cleaning the steel girders of a 2,263-foot twin bridge near Dallas, Texas. Truss sections can be adjusted so that the frame spans the width of a bridge. The rig rides on steel wheels on rails and is pushed forward by workmen. The man, left, is cranking one of the screw jacks to swing half the work platform outward to clear a pier.

Special rig cuts cost of deck work

Contractor-designed traveling device rides atop bridge and supports a working platform below the deck



The platform halves are swung outward and inward by jack arms. When crews are setting or wrecking forms, special clamps on the split platform hold the forms while the sides are in lowered position.

Since it was impossible for half the platform to swing out between the twin bridges, the rig was modified. This platform was hinged so that the inner portion could be lowered by hand winch before the rig was moved forward.

The gap between the two halves of the 14-foot work platform is spanned by 2-foot-wide sections of plywood backed by 2×4's. The platform itself is 4 feet below the bottoms of the girders.

A contractor-built rig makes working underneath a bridge deck nearly as convenient as working on top.

Used by Whittle Contracting Co, Dallas, Texas, the traveling device saves time in setting and wrecking deck forms. It is also helpful in cleaning and painting the steel girders.

With the aid of the rig, 25×6-foot form sections can be stripped as a unit, carried forward beneath the deck, and then reset. When form sections are handled as a unit from a convenient work platform, the contractor saves many valuable man-hours.

Platform bypasses piers

Basically, the rig is a work platform hung from an overhead frame that spans the width of a bridge. It is pushed forward on rails that rest either on the girders or the completed deck. When the platform is blocked by a pier, its two sides are swung outward by means of four ratchet-type jacks. After bypassing the pier, the two sides are cranked back into position. Special clamps on the split platform hold the previously stripped form sections while the sides are being raised and lowered.

Rig fits different bridges

Designed and fabricated to the contractor's specifications by Dunn Form & Steel Co., San Antonio, Texas, the rig's heavier members are of 6-inch H-beams, while the trusses are built of steel angles. To accommodate decks of various widths, the overhead

truss sections can be overlapped and bolted together at different intervals.

The 14-foot-wide platform hangs about 4 feet below the bottoms of the bridge girders. Men work from a plywood deck set on wood framing. The framing is supported by cantilevered steel trusses. The gap between the two halves of the work platform is spanned by 2-foot-wide sections of plywood backed by 2×4's. These sections are set to one side while the rig is bypassing a pier.

Whittle has been making good use of the device for several years. One of its recent jobs was on a 2,263-foot twin bridge near Dallas. The steel-girder bridge carries the four lanes of the State Highway 183 extension over the Elm Fork of the Trinity River.

Two rigs for twin bridge

On this job, Whittle used two traveling platforms—one for each bridge. The men made use of the rigs to strip forms and to clean and touch up the steel girders. (The painting was done by another contractor.) Although the rigs were used to set forms on other jobs, it was expedient to set the deck forms for this particular bridge from the top of the steel in the conventional manner.

The closeness of the two bridges made it necessary to modify the method of bypassing the piers. With the bridges only about 4 feet apart, there wasn't enough room for one of the arms of the platform to swing outward. To solve the problem, Whittle had one of the platforms rebuilt in two sections; these were hinged together so that the inner section could drop down to bypass a pier. The inner section was raised and lowered with two hand winches.

THE END

Ample room is provided underneath the bridge deck for crewmen to work. The rig, designed and fabricated by Dixie Form & Steel Co., San Antonio, to specifications of Whittle Contracting Co., Dallas, has been used on a number of jobs by the contractor.

Vermilya-Brown brochure marks firm's 106th year

■ To commemorate the beginning of its 106th year, Vermilya-Brown Co., New York City, has issued a 4-color brochure, "In Our Second Century." The 44-page booklet is a guide to many of the eastern seaboard's buildings and institutions that the company has constructed.

Each presentation has a picture of the building, the name of the architects, and noteworthy construction and historical facts.

The brochure contains photographs and biographies of the company's executive officers. The estimating, cost accounting, and accounting departments are also pictured and described.

Timken shipping center to be built in France

■ Timken France, a division of The Timken Roller Bearing Co., Canton, Ohio, will build a 15,000-square-foot shipping center at its plant in Colmar, France. Costing an estimated $300,000, it will be built as an extension to the new finishing building. Storage of the center will be 1,500,000 bearings. A perpetual inventory system utilizing automatic accounting machines will be installed and in operation by fall, when the plant is expected to open.

VICTOR

for hardfacing **NI-MN RODS** *for build-up for attachment*

Victor Ni-Manganese for Build-up is 4½% nickel, 13% manganese alloy, specifically developed for rebuilding manganese steel parts such as bucket teeth and lips; rail frogs and switches; crusher, dredge, pulverizer components. May be used as finish build-up or underbase; forms sound, slag-free welds; high deposition rate and good weldability. Deposits are austenitic with full Hadfield steel properties; nonmagnetic, tough and ductile; stands roughest abuse. Made in 5/32", 3/16" and 1/4" diameters; bare, for manual application by DC, reverse polarity.

Victor Ni-Manganese for Attachment welds crack-free, is specially recommended for difficult joining applications on manganese or carbon steel castings, such as: Dipper teeth and lips; track and drive sprockets; dragline pins and links; rail crossovers, switches and frogs; rolling mill parts; crusher screens, hammers, rolls and mantles; dredge parts. Deposited metal is extremely tough, wears well, has high impact strength. It's a wonderful, low-cost substitute for "stainless" where joining rather than corrosion resistance is chief factor. Made in 1/8", 5/32", 3/16" and 1/4" diameters for manual application by AC or DC, reverse polarity.

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For more facts, use Request Card at page 18 and circle No. 281

Ability to speed drying of sand from a wet pit aided high production on hot-mix paving of U. S. 16 near Gillette, Wyo. With a little remodeling of the Barber-Greene 848 dryer, the contractor installed three high-pressure steam burners burning No. 4 or heavier oil. The Kewanee boiler, right, supplies steam for burners.

Increase hot-mix production with

Stepped-up plant and new paver

The matching of a new Barber-Greene high-speed finisher and a stepped-up hot-mix plant provided a team that laid 1,600 or more tons of bituminous concrete per 8-hour day on a Wyoming highway job. The contractor is the Carlson-Lein Co. of Rapid City, S. Dak. The job was the resurfacing of 17.28 miles of U. S. 16 between Gillette and Moorcroft, Wyo.

The contractor had taken several steps to boost the production of the Barber-Greene Model 848 hot plant, but he found that the new SB-60 lay-down machine could take the entire output without even hurrying.

The critical factor in the plant production was the drying of the sand, which was produced from a wet pit beside a stream. A Kolman 42-inch conveyor-loader fitted with a shaker screen loaded the sand into trucks that hauled approximately 15 miles to the job. Since the sand production never got very much ahead of the paving, there was little or no time for the sand to dry out. The crushed-rock coarse aggregates, which came by rail from Minnekahta, S. Dak., and a fine sand filler were relatively dry.

High-pressure burners

To speed the drying and give better control of combustion in the dryer, Carlson-Lein removed the original low-pressure burners and rebuilt the firing end of the drum to take three high-pressure burners. These use 150-psi steam from a Kewanee boiler to atomize the No. 4 or heavier fuel oil. The result is not only an increase in the dryer's production but the elimination of smoke. Except during periods of starting or adjustment of burners, the stack exhausts only a faint brownish-gray column of dust and steam.

To get the maximum mixing capacity, the contractor speeded the engine on the plant's heavy-duty pugmill to 1,600 rpm. The conveyors, screen, and some other plant units are run by electric motors that get their power from a 100-kw diesel-generator set (Murphy diesel engine and GE generator).

The outgoing loads, averaging 15 tons of the 300-degree mix, were weighed on a Thurman 50-ton truck scale that also weighed the incoming aggregates.

(*Continued on page 53*)

Cut costly stripping & resetting time with these NEW Form-Crete STEEL FORMS

NEW FORM HANDLING FRAME*

Strips and repositions both side forms in one quick smooth action. Pulls and resets sections 50-foot or longer with ease.

The new forms and handling frame shown on this page were developed for one specific reason—to help you cut your operating costs. Each feature, the form-locks, the tilt-back, and the handling frame was fully tested under working conditions for many months. In every test, the results were the same—faster stripping and resetting of forms. Get the full story. Clip the coupon below and ask your local Form-Crete man for full details.

NEW CHANNEL FORM WITH FORM LOCK

Locked in perfect alignment during casting operation, the sides of this form flex out when locks are released allowing quick removal of product.

NEW SQUARE PILING FORM WITH FORM LOCK

Form-Lock feature locks sides in perfect alignment for pouring. When locks are released, sides flex away from product for easy stripping.

NEW TILT-BACK OCTAGONAL PILING FORM

Easily removed braces permit hinged form to swing away for quick removal of cast product.

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PF-18

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Trenching Costs Only Pennies Per Foot with the ARPS TRENCH-DEVIL

Costs Less to Buy! — Costs Less to Operate! — Costs Less to Maintain!

LOOK . . .

★ **Speeds** up to 1200′ per hour; depths — 1½′ through 4½′; widths — 2¼″ through 8″.

★ **Power Boom Control** permits fast raising and lowering of boom for rapid trenching; depths are accurately controlled, eliminating guesswork.

★ **Reversible Dirt Conveyor** is standard equipment — deposits dirt at selected distance from either side of trench. In only 60 seconds, conveyor may be switched from one side to the other.

★ **Easy Transporting** — under its own power, the self-propelled Model MA-2 may be run up skids, into a pickup truck, or driven at 2¾ M.P.H. One man loads — transports — unloads — trenches.

★ **Smaller Model JR** Trench-Devil digs 2¾″ or 3½″ wide, up to 20″ deep. Simple, one-man operation and fast — speeds of 15 feet per minute at a 12″ depth.

Write today for full details on both models. Dept. C&E

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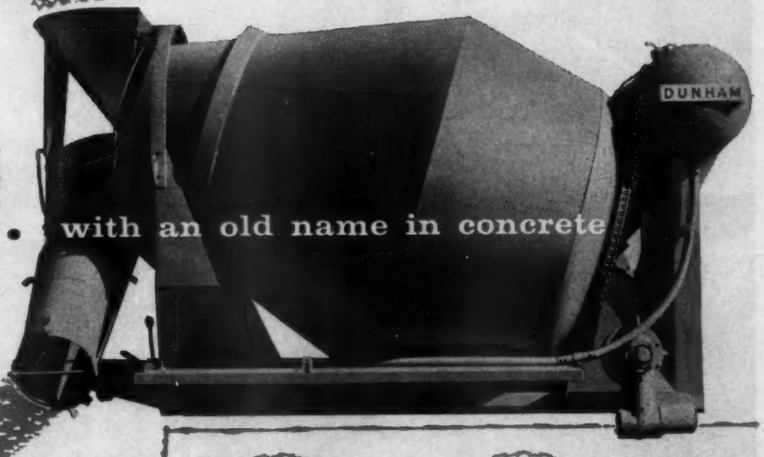
ANNOUNCING!

A GREAT NEW TRUCK MIXER . . . with an old name in concrete



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Engine take-off and motor driven models with capacities 4½ yards to 10 yards

Write for specifications and prices on sizes and models.

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We finance retail sales for distributors

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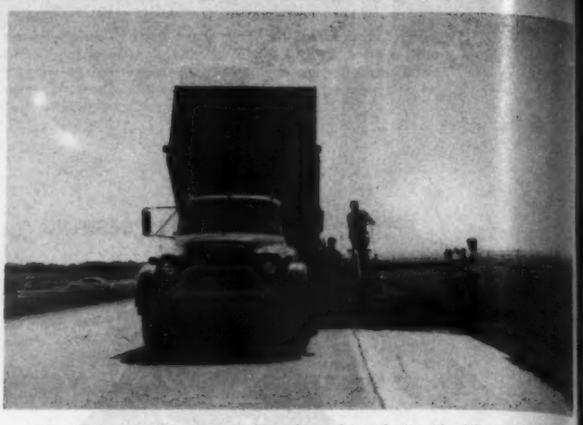
On the road, a Barber-Greene SB-60 finisher lays down the mix. A fleet of 15 GMC Model 450 trucks keeps a steady flow of material moving from plant to paver. The Perfection 8-yard boxes are designed to get the full legal weight on the front axles of the trucks.



A Blaw-Knox shouldering machine lays the 7-foot-wide lift of bituminous concrete, which is compacted to a 1½-inch depth. The "Don't Push" signs restrict pushing to start the Torqmatic-transmission-equipped trucks.

(*Continued from page 50*)

A Scoopmobile Model LD-8A with a 3½-yard bucket shuttled the sand and crushed rock from stockpiles to a Hetherington & Berner 2-aggregate cold-feed bin. The big Scoopmobile had no trouble keeping the plant supplied. A 30-inch cold-feed conveyor carried the materials to the dryer. Fine sand was added from a separate stockpile by a small conveyor feeding onto the larger one.

The hot materials went from the dryer to the 4×14-foot 4-deck gradation unit and then through the calibrated feeders to the continuous pugmill mixer. The powerful dust collector gathered the exhausted fines and returned them to the boot of the hot elevator.

The 85 to 100-penetration asphalt was trucked to the plant from the Standard Oil Co. (Indiana) refinery at Casper, Wyo., and transferred to a 20,000-gallon storage tank by a Bro circulator. High-pressure steam from the Kewanee boiler heated the storage tank and asphalt-feeding facilities.

Trucks are adapted to job

To haul the mix from the plant to the laydown machines, Carlson-Lein used a fleet of 15 new GMC trucks modified to order and especially adapted for this type of haul. The trucks were basically GMC Model 450 equipped with Torqmatic drive, power steering, and recording tachometers. The absence of clutches eliminated one of the big items of maintenance for this type of truck fleet.

The frames of the basic trucks were lengthened and strengthened, and an extra nonpowered "tag" axle was added at the rear. This provided the necessary weight distribution without the complexities of the tandem drive. On these beefed-up chassis, Perfection 8-yard dump boxes with telescoping hydraulic hoists were mounted. These boxes are higher in the front to permit a maximum legal loading on the front axles of the trucks. The result was a smooth-running trouble-free fleet.

The new Barber-Greene Model SB-60 finisher put down the binder and surface courses of the roadway.

(*Continued on page 54*)

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

Easiest Way to do Hardest Pumping

It doesn't matter where you pump or what you pump, the Homelite Diaphragm Pump is the Time-saver and Money-saver for continuous heavy-duty work. Weighs only 120 pounds, complete with Homelite quick-starting engine . . . less than ½ the weight of most diaphragm pumps of equal capacity. You set it up anyplace, fast. You do your pumping, fast. Handles anything . . . water, sand, mud, muck, solids. Manual throttle control adjusts engine speed for full 5,000 G.P.H. capacity pumping or handling small seepage flow . . . gives greater fuel economy. Suction lift of 28 feet is guaranteed. You get total heads up to 50 feet, including friction. Flapper valves have special self-cleaning action to prevent clogging. For longer wear, gears operating in oil are totally enclosed. For steady footing, pump is mounted on vibration-proof spring skids. See it in action today.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

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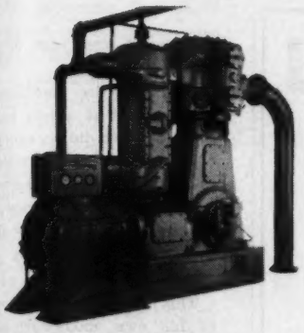
Which... ATLAS COPCO COMPRESSOR

meets your needs best?



AR Heavy-Duty Compressors

More air per horsepower than any comparable compressor! For continuous, full-load operation. "L" angle, 2-stage, double acting. Water cooled. Standard models provide 382 to 3210 cfm free-air delivery at 100 psi; only 76-590 hp required! (Can be supplied for other working pressures on request.)

What's your compressor requirement? Need an installation large enough to provide air for all your needs? Or would a small, compact unit for auxiliary operation solve your immediate problem? Either way—and for a wide range of applications between these extremes—Atlas Copco has the compressor for you!

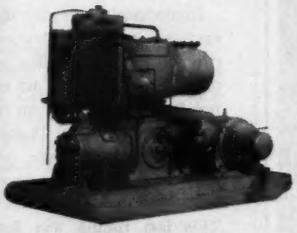
No matter which you choose, you'll get these proven advantages from Atlas Copco:

(1) More air per horsepower—less power consumption than other comparable units!

(2) Really low maintenance (one example—$310 after 10,000 hours' operation)!

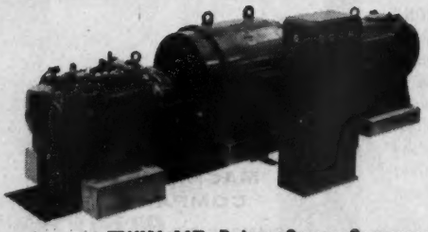
(3) Specifications are guaranteed free-air delivery—you get exactly what you order!

Get all the facts now—and compare! The coupon below will bring you a free catalog. (No obligation, of course.)



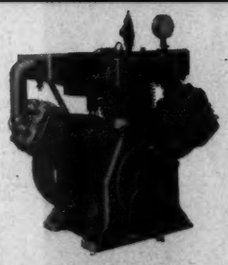
AR-L Heavy-Duty Compressors

Same basic construction as the AR Series, but provided with an air-cooled intercooler and air-cooled radiator for the cylinder water. Fan on compressor flywheel cools radiators. Perfect for arid areas or where difficult to bring in water. Both stationary and skid-mounted models available.



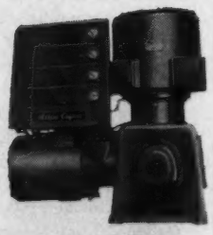
TWIN-AIR Rotary Screw Compressors

Brand new! "Twin-Air" Compressors offer capacities from 6,900 to 19,400 cfm at working pressures up to 115 psi. And, you get completely *oil-free* delivery of air or gas, since no lubrication is required — timing gears maintain small clearances between precision-mounted rotors, eliminating friction (and the necessity of oil) in compression chamber.



CT Air-Cooled Compressors

Stationary, or skid-mounted compressors for use where air demand is between 50 and 300 cfm. Totally air-cooled. Cylinder arrangement designed for smooth, vibration-free operation. Compact, rugged—for continuous, 24-hour trouble-free service. Highly efficient; low on maintenance costs.



ER-6 Heavy-Duty Compressors

New! Fundamental improvements over conventional heavy-duty compressors reduce power requirements (18.3 hp/100 cfm at 100 psi, full load); provide totally enclosed design; and save on floor space. Capacities to 1,140 cfm; standard instruments and safety devices.

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A Kenworth truck with tank trailer delivers asphalt, which is pumped by a Bros circulator into the storage tank. Little dust and steam comes out of the stack, even though the plant operates at full capacity.

Aggregates are fed from stockpiles to the plant by this Scoopmobile Model LD-8A with 3½-yard bucket. A Barber-Greene 30-inch conveyor is used to deliver the aggregates to the dryers.

The hot elevator, left background, delivers dry materials to the gradation unit. They then go through the pugmill elevator to the pugmill. The plant produced an average of 200 tph; top production was 234 tons.

MAJOR EQUIPMENT MANUFACTURERS *specify*

DIAMOND ROLLER CHAIN

...for **reliable power transmission**

INSLEY

Triple strand DIAMOND Roller Chain on INSLEY Backhoe transmits power from engine to hoists and crawler drive ... withstands the stress of sustained loading conditions to deliver smooth, reliable power.

CONSTRUCTION MACHINERY COMPANY

DIAMOND Roller Chain on CMC TRANSCRETE 6-Yard Mixer absorbs the impact of shock loads; resists damage from dust, dirt and water ... delivers the reliable power needed to mix and discharge 12½ ton batches of low slump concrete in a matter of minutes.

Your DIAMOND distributor stocks all standard types and sizes of Roller Chain. See "Chains" or "Chains, Roller" in the Yellow Pages or write to the factory for Catalog No. 759. Offices and distributors in all principal cities.

DIAMOND CHAIN COMPANY, INC.
A Subsidiary of American Steel Foundries
Dept. 487, 402 Kentucky Avenue
Indianapolis 7, Indiana

DIAMOND ROLLER CHAINS

For more facts, use Request Card at page 18 and circle No. 287

(*Continued from page 52*)

This rubber-tire machine not only moved along at a very high rate of speed but also did an exceptional job of leveling the irregularities of the old road during the resurfacing. Without even trying, the road crew could place the mat faster than the plant could turn out the mix—and plant production went as high as 234 tph.

This ingenious contractor put a few of his own modifications on this brand-new machine. He built up the sides and ends of the receiving hopper to prevent any of the mix from spilling out at the sides or between the truck and the paver. This made it unnecessary to attach wings to the back of the truck boxes, as is commonly done.

Pneumatic and steel rollers

Immediately following the laydown machine, a Rosco 11-wheel rubber-tire roller made the first compaction pass. It worked right up to within a few feet of the paver on the hot asphalt. Two Galion 10-ton tandems followed the pneumatic roller, and a final finish rolling was done by a Buffalo-Springfield 3-wheel tandem. This last rolling was done several hours after the laying operation, and sometimes not until the following day.

The paver moved straight ahead for a full day, laying a 12 or 13-foot strip of pavement. It then moved back under its own power and on its own rubber tires to start the second strip at the same place the next morning. When the first lane was rolled, the operators carefully avoided rolling the inside 2 to 3 inches of the lane. When the second lane had been placed, they rolled the joint area thoroughly, getting a good, tight, and smooth joint.

The 7-foot-wide bituminous shoulders on both sides of the roadway were laid down by a Blaw-Knox shouldering machine and rolled by one of the Galion 10-ton tandem rollers. The Blaw-Knox road widener was fitted with a hook similar to that used on the paver to hold the trucks in contact. The material was mixed in the same plant and delivered by the same trucks that supplied the mix for the roadway.

The shoulders received an addi-

final treatment consisting of an application of RC-4 cutback asphalt and ¾-inch high-visibility chips. The cutback was applied by a Rosco distributor, and the chip application was made with a Flaherty chip spreader. These light-color shoulders provide excellent definition of the black roadway.

Soil-cement base

This section of highway was built over an unstable subgrade that has always been a source of trouble. In 1952, a soil-cement base was constructed and surfaced with bituminous concrete. This roadway held up quite well, but it had developed dips and irregularities in the surface that gave it uncomfortable riding qualities.

Under Carlson-Lein's $407,610 contract with the Wyoming State Highway Department, the old surface was broomed clean, given a tack coat of 85 to 100-penetration asphalt, and smoothed with a leveling course. This lift of plant-mix material with maximum ½-inch aggregate was spread by two Galion motor graders over a 40-foot width that included the old paving and the shoulders. It varied in thickness from 0 to more than 1½ inches and averaged about ½ inch over the complete job.

The paver then laid two 13-foot-wide lanes of binder course down the middle of the 40-foot roadway. This was a mix with maximum ¾-inch aggregate, and it was laid to a compacted depth of 1½ inches. The Blaw-Knox shouldering machine then laid the 7-foot-wide shoulders on either side of the 13-foot lanes to complete the 40-foot width.

Surfacing

The surface course of maximum ½-inch aggregate was laid by the Barber-Greene paver to a compacted depth of 1 inch in two 12-foot-wide lanes. Each course was given a fog tack coat of 85 to 100-penetration asphalt heated to 350 degrees before the next course was laid down and given a rolling.

This project is one of the emergency-work-program jobs taking advantage of the 65–35 per cent cost sharing between federal and state funds. It will serve eventually as the service road beside the new Interstate 90, which will follow the same alignment but will be built on new right-of-way beside the old road.

Personnel

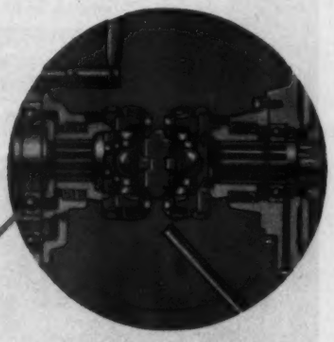
The spread for Carlson-Lein Co. was run by job superintendent Loren "Swede" Bredenberg, who was assisted by George Parks at the plant, Wes Gednalski on the laydown, and Louis Shoop handling the trucks.

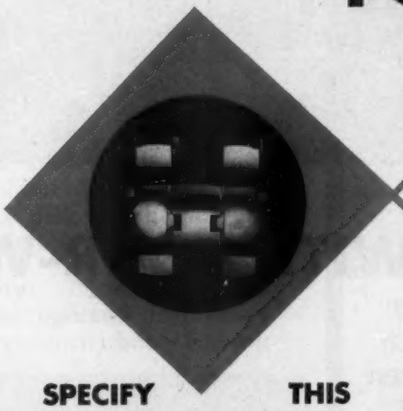
This project was supervised by the Sheridan District of the Wyoming State Highway Department, which has George R. Anderson as district engineer. Russell "Neb" Doud is resident engineer for the work in the Gillette area, and Clarence Fox was project engineer over this contract. J. R. Bromley is chief engineer of the department, and R. G. Stapp is state construction engineer. THE END

Superintendent Swede Bredenberg makes good use of his GE mobile radio to keep in touch with crews at the batch plant and the finisher.

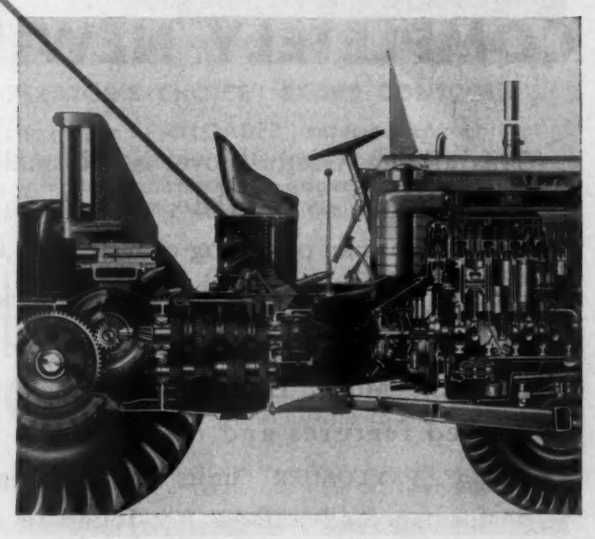
One of several rollers compacting the mat is a Galion 10-ton tandem. The finisher easily keeps ahead of plant production, which in one day reached 1,865 tons.

LIMITED SPACE CALLS FOR CLOSER COUPLING





SPECIFY THIS CLOSE-COUPLED "C"-TYPE MECHANICS ROLLER BEARING UNIVERSAL JOINT



If you are faced with the problem of locating a universal joint in a space where limited clearance does not permit the use of a flanged joint, MECHANICS close-coupled "C" Type Roller Bearing UNIVERSAL JOINT is your solution. This joint is specially designed for operation within cramped quarters that engineers formerly considered too short to accommodate a universal joint. Let our engineers show you how MECHANICS close-coupled UNIVERSAL JOINTS will conserve space, compensate for offset shafts and provide ample angularity in your new, compact models.

MECHANICS UNIVERSAL JOINT DIVISION
Export Sales: Borg-Warner International
36 So. Wabash, Chicago 3, Illinois

MECHANICS UNIVERSAL JOINT DIVISION
Borg-Warner • 2030 Harrison Ave., Rockford, Ill.

For more facts, use Request Card at page 18 and circle No. 288

New H-30 PAYLOADER

COMPLETELY NEW WITH FOUR-WHEEL DRIVE

This all-new tractor-shovel is the smallest "PAYLOADER" ever made with 4-wheel drive. It has an operating capacity of 3,000 lbs. and is available with 1 cu. yd. bucket.

In spite of its compact size and modest price the Model H-30 has the latest improved features and refinements of the larger "PAYLOADER" units and has many performance advantages not found in any other machine.

If you want all the advantages of Hough 4-wheel drive performance and value to fit a tight budget ask your "PAYLOADER" Distributor to show you the Model H-30.

MORE POWER • MORE REACH AND MORE DUMPING HEIGHT

For more facts, use coupon on facing page or circle No. 289

FAR AHEAD OF ANY MACHINE IN THIS CLASS

Full of exclusive features for better performance

More Power: 77½ hp heavy duty engine provides more power than any comparable machine.

More Dumping Clearance: 8'-½" clearance under bucket edge, dumped — even more than some larger machines.

More Reach: 32" dumping reach ahead of front tires — twice the reach of any comparable machine.

More Reliable Brakes: 4-wheel hydraulic brakes instead of 2-wheel for equal braking forward or reverse. Sealed to keep out dust and dirt. Separate parking brake on drive shaft.

Full Power-shift Transmission plus torque-converter: Provides three speed ranges in each direction. All shifts in either direction can be made "on-the-go" with a flick of the fingers. No need to stop for any "range" shifts.

More Operator Visibility: New slope-down front end styling gives the operator full vision of the bucket digging action without leaning over the side.

More Safety: All boom structures are positioned ahead of and away from the operator. Standard ladder with hand rails makes it easy and safe for the operator to get on and off.

Closed, Pressure-controlled Hydraulic System: Oil reservoir is closed and pressurized to exclude dirt and dust — includes built-in cartridge type oil filter and a fine mesh strainer.

Positive Oil Cooling: Separate fan-cooled oil-to-air radiator assures positive cooling of the transmission and torque-converter oil.

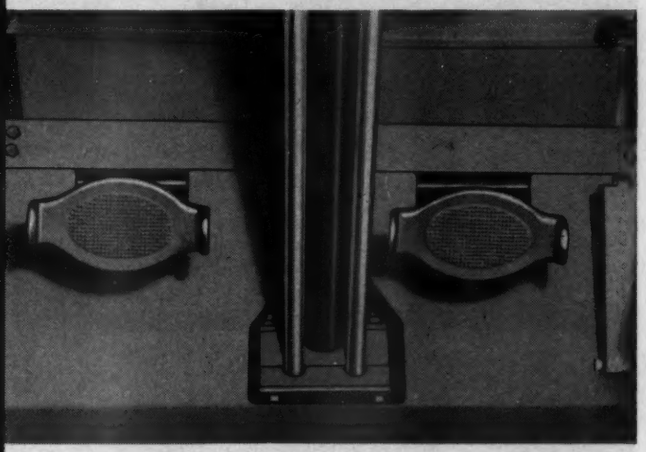
More Accessibility: Compartment on left side with quick-opening cover provides easy access to the battery and all instrument connections. Fuel tank and transmission can be checked and filled from ground level.

Steering-axle Drive Disconnect: A lever in the cab enables the driver to disconnect the rear (steering) axle-drive for over-the-road travel or whenever 4-wheel drive is not needed.

3-B-1R

HUSKY BOOM AND POWERFUL BREAKOUT

Boom arms of Man-Ten steel combine exceptional strength with light weight. A single long-stroke hydraulic ram with a high-leverage linkage to the bucket develops powerful bucket break-out action for tough digging assignments.



"OPERATOR'S CHOICE" BRAKE CONTROLS

This exclusive "PAYLOADER" service brake control provides the operator with instant choice of braking with the transmission engaged (left pedal) or disengaged (right pedal) without manual effort.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Send complete Model H-30 "PAYLOADER" data

Name _____

Title _____

Company _____

Street _____

City _____ State _____

3-B-1

model 12 PAYLOADER
PAYLOADER
MAC-WELL CO.

"Fastest basement diggers you can get"

Stan Renaud, excavating contractor of Denver, Colorado, bought his first Model 12 in October, 1958 and added a second in May, 1959. Marvin Meier, one of his operators who has driven a lot of tractor-loaders, says, "These Model 12's are the fastest basement diggers you can get. They dig easier and can come out of the hole backward or forward without spilling any of their heap loads. They're one machine that can accurately skim ½-inch deep and let the operator watch the cut he is making. Besides, they are so easy to handle you can't even find other equipment you can compare with them."

BETTER BALANCE: Rear-mounted engine is the first big difference on the Model 12. It counterbalances the digging and loading forces . . . keeps the entire track length on the ground for better traction and flotation . . . reduces strain and wear on the front idlers and the entire track assembly . . . gives the operator a smoother, easier ride and fullest visibility.

FASTER OPERATION: Power-shift Transmission gives instant fingertip shifting without foot clutch; provides 3 speeds in each direction—low speed for powerful digging action and high speeds for fast shuttling.

EASIER OPERATION: Power-steer is a fingertip action without foot brakes to fight . . . reduces operator effort to a minimum.

"the best machine we have for moving dirt in a hurry"

That's what Chuck McLaughlin, V. P. of Mac-Well Co. of Los Angeles, Cal., says about their Model 12 "PAYLOADER", and continues, "We've loaded 1400 yards into trucks with it in an 8-hour day. The hydraulic ripper attachment comes in handy in lots of places too, such as this decomposed granite that is easier and cheaper to rip before loading."

His operator adds, "I like the power-shift transmission and power steering — what operator wouldn't — and the tremendous power and traction of the Model 12."

HOUGH, PAYLOADER, PAYLOGGER, PAYMOVER and PAY are registered trademarks of The Frank G. Hough Co., Libertyville, Illinois.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE COMPLETE STORY of the Model 12's superior design and performance and its greater profit potential is explained in this bulletin. Write for your copy.

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Please send more data on the Model 12 "PAYLOADER"

Name _____

Title _____

Company _____

Street _____

City _____ State _____

3-C-1

For more facts on spread on [illegible] use coupon or circle No. [illegible]

Earthmoving contractor overcomes water-table problem on technical center job

A Cat Traxcavator loads a D8-No. 80 scraper with material from footings, as excavation nears completion at the laboratory site for Caterpillar's new technical center at Mossville, Ill. A perched water table, covering 125 acres, was unearthed 10 feet below site grade, and 60 dry wells were sunk to permit water to drain down to normal static level.

■ Efficient use of earthmoving equipment recently enabled subcontractor McDougal-Hartmann Co., Peoria, Ill., to complete a 925,000-cubic-yard site-preparation project well ahead of schedule, in spite of encountering a 125-acre perched water table, 10 feet below site grade. The project was the first phase in the development of a new technical center in Mossville, Ill., for Caterpillar Tractor Co., Peoria.

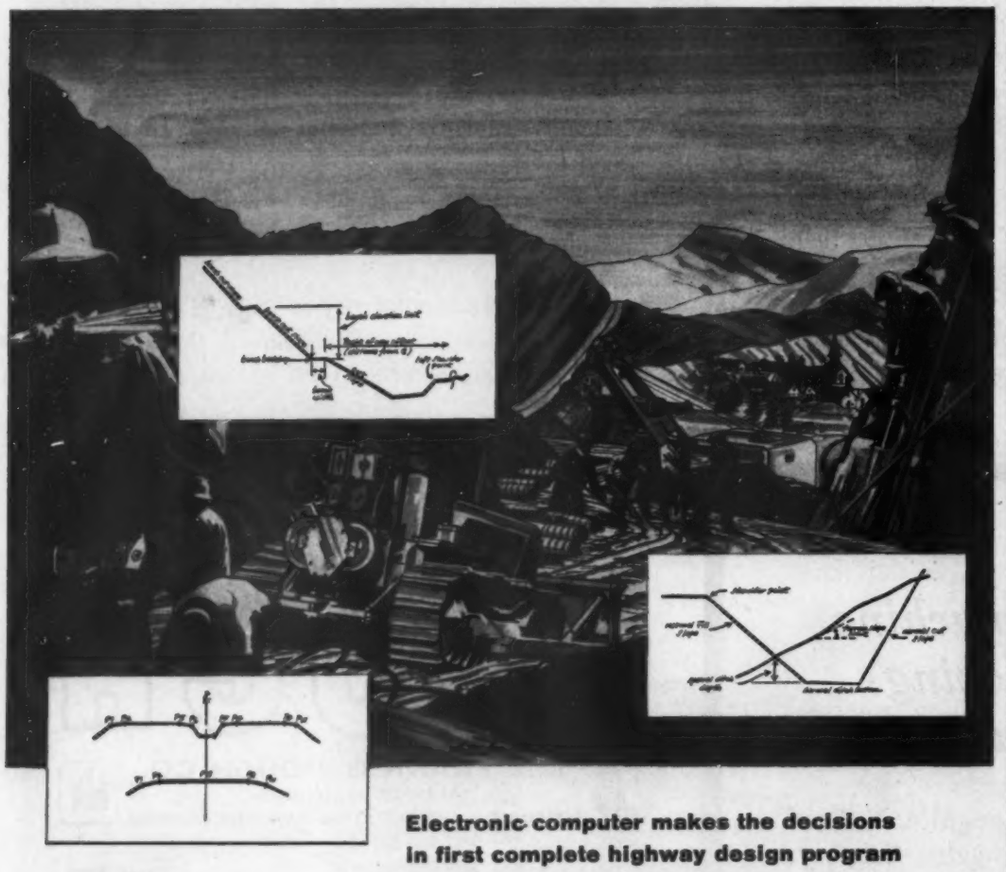
Since the building excavation consisted primarily of sand, job superintendent George Smolek decided to split the scraper fleet. Five Cat DW21's, pushed by two D8's, tackled the sand excavation. The 4-wheel units—two DW20's and two DW15's, with a single D9 pusher—were assigned to a nearby site containing sandy clay. Although haul distances differed—the DW21's traveled 800 feet, negotiating a 3 to 1 ramp leading out of the excavation, and the DW20's covered 3,500 feet—each unit chalked up 60 to 65 loads in 10 hours. Alternate 6-inch layers of sand and sandy clay fill were spread over the area, then watered and rolled to attain the required 90 per cent modified Proctor.

To water the fill for an 8 to 15 per cent optimum moisture content, Smolek hitched two 3,000-gallon water trucks in tandem onto each of two D8's. The fill was watered and compacted at the same time: one D8 pulled two vibratory Terrapac rollers, and another D8 towed a Hyster 66-inch compactor and a Tampo 50-ton rubber-tire roller—in addition to the water trucks.

Perched water table

While excavating a larger building site, the contractor discovered a perched water table about 10 feet below site grade. The underground "lake" was trapped by a 5-foot-thick layer of stiff brown-to-gray clay. Darin & Armstrong of Detroit, the general construction contractor, drilled 60 wells to a depth of 40 feet at the rate of three per 8-hour day so that an estimated 40 million gallons of water could filter down to the natural water table.

While the wells were being drilled, McDougal-Hartmann's crew moved to another borrow area. As one section of the site reached grade, Smolek assigned two DW21's to build one of the secondary roads, which was soil-cemented and is scheduled to be blacktopped. A Cat No. 12 motor grader maintained the haul road, and a D8 Series H tractor spread fill. Push-loaded by a D9, the DW21's scooped up 18 to 20 pay yards of silty sand in an average of 35 seconds and completed the 4,000-foot haul-and-return cycle in less than four minutes.



Royal Precision

LGP-30

Electronic computer makes the decisions in first complete highway design program

Now, for the first time, a complete highway design program has been formulated for computer operation. Developed for exclusive use on the low-cost, large-capacity Royal Precision LGP-30, the new program allows you to design any type of highway—including county roads, single-lane primary or dual-lane interstate systems.

With this unique program, produced in cooperation with the LGP-30 users organization, the computer supplies a maximum number of design decisions such as those for slope, superelevation adjustments, widening corrections, special ditches, earthwork calculations—including rock excavation and straight cut and fill.

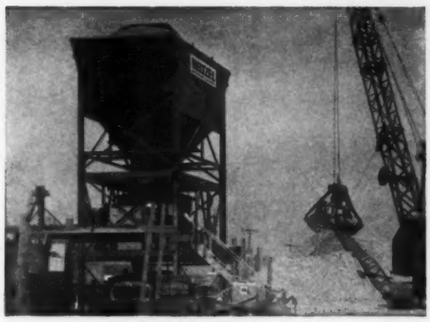
All you require to compute your desired roadbed is raw field data, design constants and semi-permanent data. And you can change highway types merely by selecting the proper highway code plus the correct template.

The low-cost LGP-30 is delivered to you ready for operation. No site preparation or additional equipment is required. What's more, it's the easiest computer to program and operate. Customer training is free. An extensive library of sub-routines and programs—including those for highway design—is available.

Royal Precision Corporation

Royal Precision is jointly owned by the Royal McBee and General Precision Equipment Corporations. LGP-30 sales and service are available coast-to-coast, in Canada and abroad through Royal McBee Data Processing offices. For complete specifications on the LGP-30 and all the facts on the new highway design program, contact your nearby Royal McBee Data Processing Representative, or write ROYAL McBEE CORPORATION, data processing division, Port Chester, N. Y.

For more facts, use Request Card at page 18 and circle No. 291



Heltzel 150 ton, 3 compartment, unitized type 200 aggregate bin. Three, 50 ton compartments. Twin, 1½ yard automatic batchers.

In South Carolina, too . . .

the move is to Heltzel's unitized, portable batch plants

Contractors across the country are taking advantage of Heltzel's easy to set-up and dismantle, fast, accurate batch plants . . . designed to fit each specific requirement.

Simplified design includes easy-to-handle sections that require only a minimum crew and standard crane equipment to set-up in record time. Factory assembled elevators, batcher and bin sections, may be shipped as complete "package" units—easily set in place—accurate—fast-operating and rugged.

It will pay you to investigate Heltzel Batch Plants for maximum versatility and cost-reducing operation. Write for free data containing complete details.

Heltzel E-3, 357-390 barrel, unitized portable cement batching plant. Automatic twin batchers. 671-742 bbl. single compartment, portable cement tank.

HELTZEL STEEL FORM AND IRON CO.
WARREN, OHIO

For more facts, use Request Card at page 18 and circle No. 292

Tough underpass job finished on time despite high groun

GULF MAKES THINGS

Take the unusually high ground water level of New Orleans, add a lot of rain, then tackle a job like this on a tight schedule. Build a $2,000,000 underpass beneath a 3-deck interchange (all decks in use with heavy traffic) with headroom under ramps as low as 22 feet. Brother, you've got a tough one.

That was the case with Melvin "Red" Morgan, Project Superintendent for R. P. Farnsworth & Co., Inc., New Orleans. His job was to build an underpass system beneath the Airline Highway-Causeway Boulevard Interchange for the Department of Highways, State of La isiana. (Palmer & Baker, Inc., were the consulting eng neers.) To add to his construction problems, a busy ni road line angled across the site.

Farnsworth & Co. finished the job on time—with he from clean-burning Gulf diesel fuel, clean-working Gu Dieselube H.D. motor oil, and Gulflex A grease. Gu products enable Farnsworth's engines to run clean wi maximum power output. Equipment stays on the jo with a minimum of mechanical delays. And maintena

High ground water kept shovel tracks soaking wet throughout the digging operation. Here, a workman performs preventive maintenance with Gulflex A multi-purpose grease.

Gulf Sales Representative Al Pfister, right, with Farnsworth Project Superintendent Melvin Morgan. You can always rely on helpful petro-engineering service from Gulf at the job site.

water level and low headroom . . .

GS RUN BETTER!

costs are trimmed to the bone. Proof, again, that Gulf makes things run better!

"Red" Morgan says, "During the 16 years I've been with Farnsworth, I have used Gulf fuels and lubricants on every job but one. That's why I knew that we wouldn't have any combustion or lubrication problems with Gulf oils and greases."

You can do the job faster and reduce maintenance costs with Gulf products and service. For proof, call your Gulf office, or write for "Gulf Contractors' Guide."

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Please send "Gulf Contractors' Guide."

Name_____
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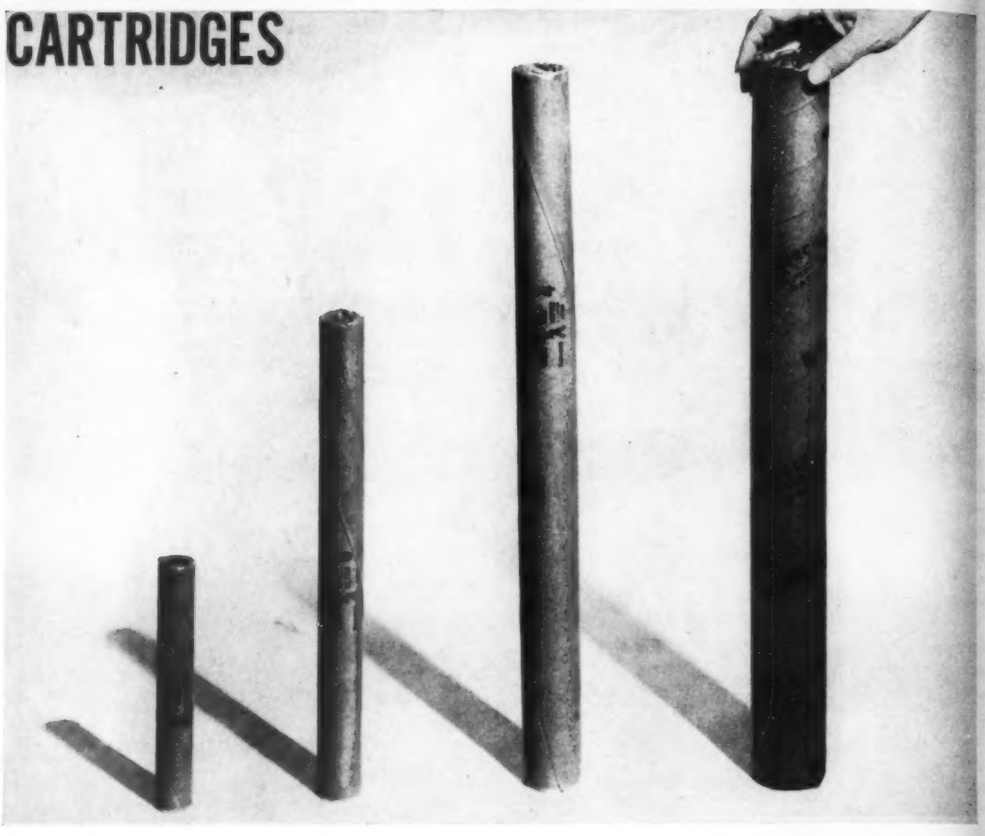
SP-9739

HERCOL®—A LOW-COST EXPLOSIVE—NOW AVAILABLE IN SMALL-DIAMETER CARTRIDGES



The Hercol series of low-cost, cap-sensitive, high-ammonia-content explosives are now available in cartridges of small diameters and standard lengths, as well as in the larger diameters and special packings.

The ability of Hercol to produce excellent fragmentation, its water resistance, Class 1 fumes, and high cartridge count—plus its low cost—have already been proved to the economy-minded quarry and open-pit operator.

Now that Hercol is manufactured in the smaller diameters, with Class 1 fumes, these same economies are available to the underground operator.

Contact the Hercules sales office nearest you or ask your Hercules representative for more detailed information on how Hercol can reduce blasting costs for you, too.

Properties of Hercol

	Hercol	Hercol 2	Hercol 4	Hercol 6
Fumes	Good	Good	Good	Good
Cartridge count—1¼ by 8-in. cartridges per 50 lb.	130	120	140	155
Cartridge diameter, in.	4 to 8½	1 to 3½	1 to 3½	1 to 3½
Weight strength, %	70	68	68	68
Cartridge strength, %	48	50	34	19
Water resistance	Fair	Good	Fair	Fair

A special grade of Hercol is formulated for seismic "pattern shooting" when the drill-holes are relatively dry.

Explosives Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington, Delaware

XR60-1

BIRMINGHAM • CHICAGO • DULUTH • HAZLETON • JOPLIN • LOS ANGELES • NEW YORK • PITTSBURGH • SALT LAKE CITY • SAN FRANCISCO

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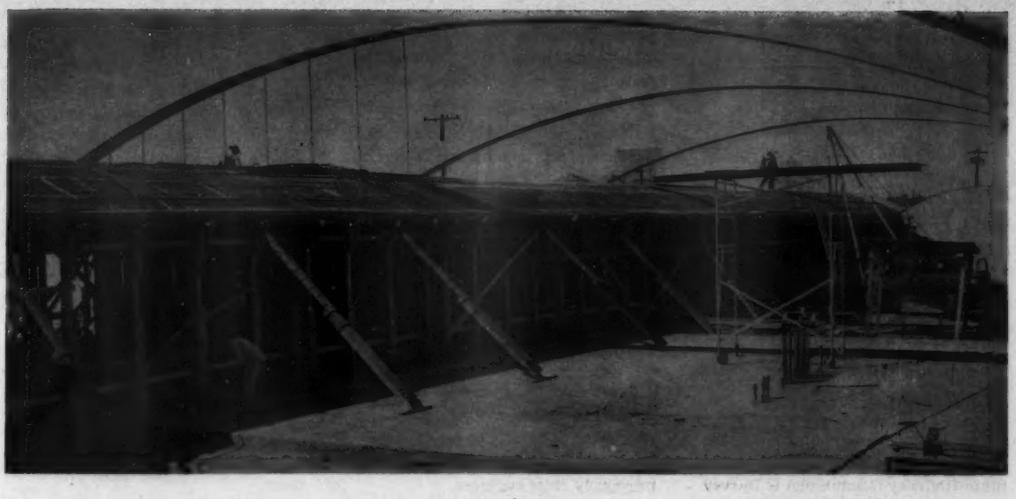


A 30,000-SQUARE-FOOT BOWLING ALLEY being erected in Oklahoma City will have a roof suspended from five concrete arches that rise from the ground on both sides of the building. The concrete wall slabs were cast on the site and raised into place; floors, the five arches, and the roof were cast in place. The contractor used Ellis shore clamps for shoring hundreds of members at once. The Ellis method, requiring no measuring, sawing, or splicing, was used again and again, saving dollars and time on the project.

Two new relief maps of U. S. and the world

New 3-dimensional views of the world and the United States—showing the shape of the land as it really is—have been published by Aero Service Corp. Both of the 28×18-inch, 8-color plastic maps show mountains and valleys in detailed relief that stands up nearly half an inch.

The detailed 50-state U. S. map shows 4,000 geographic names. It includes 2,000 cities and towns, 1,000 rivers and lakes, 150 national parks and monuments, and over 200 mountain ranges and peaks. Its scale is 117 miles to the inch. A handy 26×14-inch index slides out from the back of the map.

The companion world relief map features nearly 2,500 place names. This includes 1,200 cities and towns; 400 large bodies of water; 450 islands, mountain ranges, and peaks; and many other features. All place names appear on the pull-out map index. Map scale is 962 miles to the inch.

Both the U. S. and world maps have mahogany-colored plastic frames and are delivered ready to hang.

Cost of the new 28×18-inch maps is $9.95 each; 64×40-inch counterparts of these maps sell for $47.50 each. Aero's relief maps are available from retail stores, or from Aero's headquarters at 210 E. Courtland St., Philadelphia 20, Pa.

Burns & Roe subsidiary

A wholly owned subsidiary, Burns & Roe Western Hemisphere Corp., has been established by Burns & Roe, Inc., New York City. It will handle engineering and construction jobs in North, Central, and South America and the West Indies, but not in the United States.

"Turner City" available to construction people

Turner Construction Co., New York City, is distributing its 1959 "Turner City," a composite drawing of buildings constructed by the company during the past year. All of the buildings were more than half completed at the end of 1959. More than 12,000 copies of the "City" are distributed annually to architects, engineers, and others interested in construction.

How to screed stiff concrete

Special underslung beam construction was required for this 14-foot span since the rails were located above the surface of the concrete. Chicopee River Bridge on Massachusetts Turnpike.

Screeding 40-foot-wide Bridge Deck—Two STOW 40-foot underslung screeds with two power paks on each used on this expressway.

Rolling Back—The front-end roller automatically flips up to support the screed off the concrete when the operator lifts the handle, making it simple to roll back for a second pass.

Screeding a new third lane on a hill with a 14-foot screed. Burlap was pulled along after screed to roughen surface.

Screeding 2-inch slump floor at new IBM Owego Plant with 25-foot STOW screed.

24-foot, 8-inch STOW screed on housing project. Builder saves 16 man hours per slab.

USING VIBRATING SCREEDS. A vibrating screed is used to strike off concrete surfaces and at the same time vibrate the concrete. Because of the vibration, stiff concrete (even two-inch slump or less), can be placed and struck off more efficiently and economically than by hand methods.

A vibrating screed consists of a vibrating unit mounted on a beam and a pair of end roller and handle assemblies. The vibration is transmitted through the length of the beam directly to the concrete. There is no transverse movement of the beam. The screed is merely drawn directly forward with the end rollers riding on the forms. The Stow screed can be obtained either complete with the beam or as a package assembly without the beam. Complete directions are shown in Stow's Catalog for building your own wooden prestressed screed beam.

ADVANTAGES OF VIBRATING SCREEDS. A Stow vibrating screed, because it does not have transverse movement, permits the building of any reasonable crown or grade into the bottom of the beam to conform to the requirements of the slab.

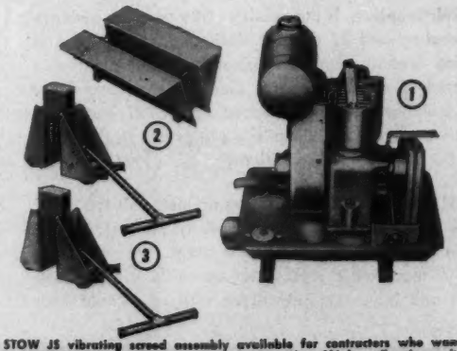
Vibrating screeds not only strike off the surface and shape it as they are advanced, but they vibrate the concrete at the same time. This means that all of the advantages of vibration are obtained, such as greater density and compaction of the concrete. Because of the vibration, a much stiffer mix can be struck off (two-inch slump or less is recommended). Such stiff mixes are highly impractical to handle by hand methods. A stiff mix, of course, makes a much stronger concrete. Stow vibrating screeds have rubber vibration dampers between the end roller assemblies and the beam which rides slightly above the forms. This practically eliminates vibration from being transmitted to the forms.

A means is provided to make it simple to raise the beam up slightly off the surface. On the Stow screed, the front rollers are balanced in such a way that by just lifting up on the handle, it pivots the roller into a position that holds the beam up off the concrete. This is important since it makes it simple to roll the screed back for a second pass. It also makes it possible to stop the screed at any time without any danger of over-vibration.

Not only do vibrating screeds produce a better slab, but they save the contractor a considerable amount of money because of the speed at which they operate. Experience has shown that with the same crew a contractor, even on concrete bridge decks, can often cut his production time almost in half. Also, of course, vibrating screeds are much less fatiguing to operate than back-breaking hand strike-off methods.

For more technical data on STOW vibrating screeds, contact your STOW Distributor listed under "Concrete Vibrators" in the Yellow Pages of your phone book, or write for Form 587 and Cat. 580.

STOW MANUFACTURING CO.
Dept. B-7, 40 Shear St., Binghamton, N. Y.



STOW JS vibrating screed assembly available for contractors who want to build their own beams. Consists of item (1) a 2½-hp. vibrating unit, item (2) brackets for engine mounting, item (3) a pair of end rollers, handles and necessary bolts. (Notice vibrating head underneath engine.)

STOW MANUFACTURING CO., Dept. B-7
40 Shear St., Binghamton, N. Y.
Please send me full bulletin *"Advantage and Use of the Vibrating Screed"* and Concrete Equipment Cat. 580.

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____

For more facts, use coupon or Request Card at page 18 and circle No. 294

Names in the News

Harvey O. Grasse, chairman and chief administrative officer of the Wisconsin State Highway Commission, Madison.

Grasse is chief officer of Wisconsin highways

The new chairman and chief administrative officer of the Wisconsin State Highway Commission is Harvey O. Grasse. He succeeds Harold L. Plummer, who retired. Another new member of the commission is Vere L. Fiedler.

Grasse has been a member of the Door County (Wis.) Highway Committee and is now vice president of the Wisconsin County Highway Committee Members' Association.

Daniel Construction news

George McDougall has been appointed manager of all South Carolina operations of Daniel Construction Co., Birmingham, Ala. He was previously chief engineer.

Austin Co. opens firm

The Austin Co., Cleveland engineering and construction firm, has established a new company in Argentina, with headquarters at Avda. Pte. Julio A. Roca 610, Buenos Aires. Cyril F. Prideaux is president of the new firm, which will be known as Austin, Ingenieria y Construcciones, S. A., Comercial, Inmobiliaria e Industrial.

Prideaux, who continues as president of Austin's Brazilian company, will direct the staff responsible for Argentine location surveys, plant design, engineering, and construction work. Clayton L. Foster, Austin vice president for international sales, will coordinate negotiation of new Argentine contracts with North American firms.

Fred W. Argue, president of the Stone & Webster Engineering Corp.

Top management changes by Stone & Webster

Fred W. Argue has been elected president of Stone & Webster Engineering Corp., Boston and New York City. He succeeds T. Cortlandt Williams, president since 1955, who has been elected chairman of the board.

Alfred L. Hartridge has been elected executive vice president, succeeding Argue. Dr. Arthur J. Good is the newly elected vice president and treasurer, replacing Hartridge.

William C. Pittam, project engineer for the company in charge of work on expansion of the Georgia-Pacific pulp and paper mill at Toledo, Ore., has been promoted to consulting engineer.

PCA names Parme to head new engineering group

An advanced engineering group has been formed by the Portland Cement Association at its general offices in Chicago. Alfred L. Parme, structural engineer, heads the new group. The purpose of the group will be to apply the most advanced engineering, mathematical, and physical principles, and the most modern test data, to achieve a more efficient use of concrete in all of its applications.

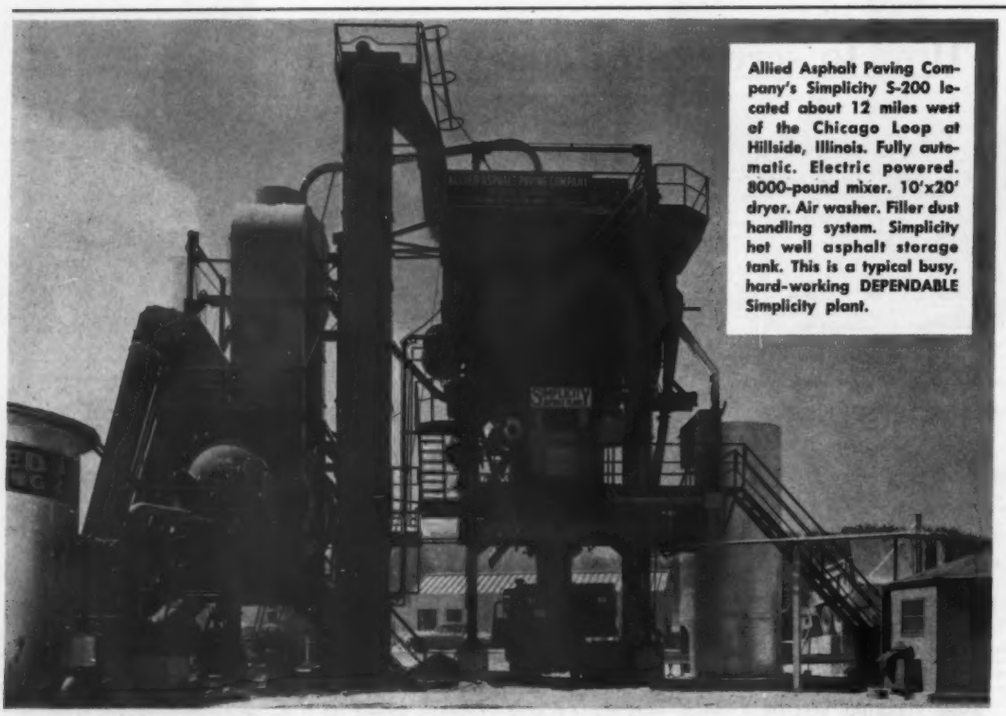
Parme's former post as manager of the association's structural and railways bureau will be filled by Walter E. Kunze. John C. Seeger, Jr., replaces Kunze as manager of PCA's personnel training.

Highway consulting firm formed by Plummer, Haas

Harold L. Plummer and William L. Haas, former chairman and director of administration of the Wisconsin State Highway Commission, respectively, have established a consulting firm devoted exclusively to highway administration and management. Called Highway Management Associates, the firm will have headquarters in Madison, Wis. Consulting services will be provided in the fields of organization, personnel, public relations, state-local relations, systems and controls, manpower utilization, operations analysis, and management appraisals.

Robbins succeeds Gunn in ARBA division

Eugene W. Robbins is the new managing director of the Contractors Division of the American Road Builders' Association. He succeeds W. Guy Gunn, who resigned to accept a post with the Associated Pennsylvania Constructors. Since 1950, Robbins has been employed by the Houston Chamber of Commerce.



Allied Asphalt Paving Company's Simplicity S-200 located about 12 miles west of the Chicago Loop at Hillside, Illinois. Fully automatic. Electric powered. 8000-pound mixer. 10'x20' dryer. Air washer. Filler dust handling system. Simplicity hot well asphalt storage tank. This is a typical busy, hard-working DEPENDABLE Simplicity plant.

The *Finest* Asphalt Plant in the World

The best asphalt plant takes practical and proven design, suitable materials, and experienced workmanship.

DESIGN: Simplicity is the result of fifty years experience in operating and 35 years in designing, improving and building asphalt plants exclusively. Asphalt plants are subjected to more destructive elements than any other road building equipment. Based on actual every-day operating experience, Simplicity plants are designed to meet the most severe conditions.

MATERIALS: We believe there are no materials too good to use in an asphalt plant. Simplicity pioneered anti-friction bearings throughout the plant. We use 12% to 14% manganese steel liners up to ¾ inch thick in mixers and have the only dryer with renewable liner plates. Regardless of cost, our specifications call for the finest in bearings, sprockets, chains, gears, scales, screens, motors, burners, and everything else.

WORKMANSHIP: A fine asphalt plant also requires workmen with ability and experience. The average age of men building Simplicity plants is 41½ years yet they average 11½ years' experience in our factory.

Under a profit-sharing plan Simplicity employees have earned over a million dollars in incentive pay. Thus every Simplicity employee has a personal interest in producing a superior product at a competitive price.

DEPENDABLE

THE SIMPLICITY SYSTEM CO.

For more facts, use Request Card at page 13 and circle No. 295

ix honored by Beavers

Golden Beaver Awards for 1960 re presented to six members at the th annual meeting, in late January Los Angeles, of The Beavers, an ganization of men and companies the heavy-engineering construc- n industry. The management award ent to Algot F. Johnson of Al John- n Construction Co., Minneapolis, d Walter Scott, Peter Kiewit Sons' Co., Omaha. Holder of the supervi- n award is Victor G. Hindmarsh, chtel Corp., San Francisco.

The award for engineering went to . J. Leen, U. S. Army Corps of En- neers; the award for supply, to Tim Riley, Ingersoll-Rand Co., Phillips- rg, N. J. A special award was pre- nted to Lt. Gen. Raymond A. heeler (U. S. A., ret.).

Kane to start PR firm

Robert F. Kane, public relations irector and advertising manager for . H. McGraw & Co., New York City, as resigned to open his own public- elations firm in the city. The new irm, to be known as Robert Francis Kane & Associates, is located at 51 . 42nd St. Kane will continue to epresent F. H. McGraw on an agency asis. The new firm will specialize in ublicity accounts in the building and eneral industrial fields.

Engineering firm names

C. William Maxeiner has been named senior vice president and gen- eral counsel of J. H. Pomeroy & Co., nc., international engineering and construction firm with headquarters in San Francisco. Maxeiner was formerly a partner in the law firm of Thelen, Marrin, Johnson & Bridges.

Walter P. O'Farrell has been elected a member of the board of directors. A vice president of the organization, O'Farrell is currently managing di- rector for the $16,500,000 Pomeroy contract for construction of the Oak- land-Alameda tube, now being built for the California Division of High- ways.

ACPA names two

Roy Aaron and Jack C. Williams have been appointed assistants to the managing director of the American Concrete Pipe Association.

Hill & Ingman promotes

William J. Chase has been pro- moted to junior partnership in the Seattle consulting engineering firm of Hill & Ingman. Chief design en- gineer of the company since 1957, Chase is a licensed professional en- gineer in Washington, Idaho, and Montana.

Kahn Associated elects

The board of directors of Albert Kahn Associated Architects & En- gineers, Inc., Detroit, has elected R. Hudson, C. M. Labunski, J. Nachbar, J. S. Pettitt, and S. D. Popkin to be- come associates in the organization.

John C. King, speaker, at the 1960 Concrete Exposition and National Concrete Contractors convention.

Concrete Exposition held in Philadelphia

John C. King was one of the principal speakers at the 1960 Concrete Exposition and National Concrete Contractors convention held at the end of January in Philadelphia. He discussed factors that have contributed to increased use of concrete in the U. S. and abroad. King stressed ready-mix producer and contractor cooperation; recent developments in forming, finishing, and other construction techniques; and use of proper admixtures for the improvement of concrete.

King, who is a noted civil engineer and specialist in the field of concrete construction, is a product development engineer for the Master Builders Co., Cleveland.

Engineers' council elects

Walt J. Hanna, Jr., has been elected president of the California Council of Civil Engineers and Land Surveyors. Other newly elected officers are Charles W. Christiansen, first vice president; Harold Musser, second vice president; and William Pafford, secretary-treasurer.

Hanna was president of the Monterey Bay Chapter of the council in 1958 and 1959, and was chairman of its state legislative committee for two years.

Burns & Roe names

Richard T. Richards has joined Burns & Roe, Inc., New York City, as supervising civil engineer.

Turner elects officer

Carleton F. Rosenburgh has been elected secretary of Turner Construction Co., New York City. With the company for 34 years, Rosenburgh has been a director since 1947 and a vice president since 1953.

This all day sucker . . .
This hose can't kink when twisted, can't flatten when crushed even by the heaviest construction equipment. Acme-Hamilton Suction hose is reinforced with a continuous spiral of special non-metallic resilient reinforcement which gives it built-in bounce! The smooth-bore tube increases rate of flow, reduces turbulence. Costly downtime through accidental crushing is minimized with A — H Cord Suction Hose.
Check these features:
(A) Abrasion resistant red cover.
(B) Cotton duck plies.
(C) Rubber bonded plastic cord in 2½" and 3" sizes only.
(D) Smooth bore tubes.
Specify Acme-Hamilton cord suction hose when you order from your distributor, or write to Acme-Hamilton, Dept. S-3.
A
C
B
D
Acme Hamilton
MANUFACTURING CORPORATION, TRENTON 3, N. J.
ATLANTA • CHICAGO • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES
MILWAUKEE • PITTSBURGH • SALT LAKE CITY • SAN FRANCISCO • SEATTLE
For more facts, use Request Card at page 18 and circle No. 296

Pit-run aggregates that need no crushing to meet spex made production of asphalt-stabilized base a breeze during work on U. S. 101 near Bandon, Ore. The plant is a composite of Warren and Madsen units.

Unusual gravel deposit meets spex without crushing

Gravel is dozed directly from pit to hot-mix plant supplying asphalt-stabilized base job on highway

An unusual gravel pit proved to be a real bonanza for Warren Northwest, Inc., Portland, Ore., for the paving of a 1.88-mile section of new alignment for U. S. 101 at Bandon, Ore. The pit, located adjacent to the job, produced aggregates that met specifications without crushing; there was a very minor waste of oversize and fines.

A dozer blended the materials in the long, shallow pit as it pushed them to the tunnel. As the pit-run material was conveyed into the asphalt plant, a few large stones were picked off the belt by hand. The plant screens then rejected the small amount of material over 1 inch, and the slight excess of fines was permitted to blow out through the stack. The remaining gravel was dried, mixed with 4½ to 5 per cent of asphalt, and laid in three courses to produce a 6-inch asphalt-stabilized base.

The pit was all the more remarkable in view of the fact that this coastal area contains very little sound rock. Crushed-rock aggregates are, therefore, of questionable quality or very expensive—or both.

Warren Northwest, Inc., subbed the paving on the project from the general contractor, C. R. O'Neil, Creswell, Ore. O'Neil had done the grading of this new section of road, known as the Bullards Bridge-Bandon Road, a 2-lane highway that is the first element of a new and shorter alignment of the coastal highway.

Dozer works pit

The relatively shallow gravel deposit lies along the top of a low hill adjacent to the Coquille River near

Following secondary rolling by an 8-ton tandem, this new 10-ton Ferguson SP-10 rubber-tire roller does the final compaction. Suds on the tires are caused by Lux soap added to the water tanks to help keep the tires from picking up the mix.

BALANCE YOUR LOAD... BALANCE YOUR SCHEDULES!

INTERNATIONAL SIX-WHEELERS

do it with even weight distribution, step-ahead powe

Compact-design six-cylinder or V-8 INTERNATIONAL models give you the most advanced combination of engine and semi-automatic transmission in the business. There's perfect unit-to-job balance hilly country or flat. Husky, all-truck power to 345 cu. in. has the guts to pull out of a "hole" or pull ahead on the road. Select-O-Matic transmission (optional) tames every ounce of power for complete control and smooth application whatever the conditions. Shock-load to rear axle is virtually eliminated. Six-wheel models to 33,000 lbs. GVW.

When only a six-wheeler can do the job right, only INTERNATIONAL offers 84 ways to go!

INTERNATIONAL® TRUCKS WORLD'S MOST COMPLETE LINE

International Harvester Co., Chicago • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

The gravel deposit is high on a hill beside the plant tunnel; a Cat D8 tractor with U-dozer simply pushes the material to the tunnel that leads to the feed conveyor. As the dozer works over the large pit area, it mixes and blends the material to keep it all within specifications.

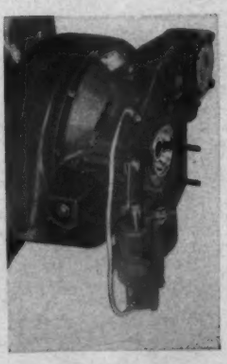
A 24-inch Warren belt feeder brings the cold material from the pit to the dryer. Only a small amount of oversize is picked out by hand; plant screens remove all material over 1 inch. The three asphalt-storage tanks have a combined capacity of 24,000 gallons and are heated by a Kewanee steam boiler.

Dependable! From reinforced cabs to extra-husky frames, V-8 powered INTERNATIONAL six-wheel trucks are quality built for fast-moving dependability. Rugged power trains including up to 549 cu. in. V-8 engines and standard differential lock-out are factory matched for heavy-duty use. Special truck pistons and rings cut oil consumption. Metered-flow water jacket evens engine temperature. Finish-honed replaceable exhaust valve guides and self-aligning hydraulic tappets further reduce nominal downtime. COE and conventional models to 65,000 lbs. GCW.

ght! Rugged, six-wheel INTERNATIONAL transit-mix chassis available with six-cylinder ine options offering up to cu. in. displacement. Every nd-foot of engine torque is ltiplied by an over-all gear uction of over 100-to-1. The werful result is dependable, oth-working tandem per-mance that keeps heavy-duty loads moving on schedule—a cost with reduced operating ense and downtime. 34,000 tandems, 15,000 lb. front es. Optional power steering iesel engines to 175 hp.

Now increase payloads and working life with direct drive flywheel power take-off!

New INTERNATIONAL factory mounted option on heavy-duty "six" or V-8 engines eliminate power take-off at front end. Direct gear drive off flywheel gives you up to 75 hp. at output shaft. There are no belts to replace, no excessive parts to wear out . . . maintenance and downtime are kept to minimum.



For more facts, use Request Card at page 18 and circle No. 297

Bullards Bridge. A wide, flat area at the base of the hill provided a convenient place to set up the asphalt plant on a piece of land next to a plywood mill. After clearing the timber and brush from the pit, the general contractor stripped some of the overburden and used it in a nearby fill.

A single Cat D8 tractor with U-dozer then took over the complete pit operation. In making long passes from the extremities of the pit to the tunnel, the dozer operator skillfully blended the poorer materials with the best to maintain a constant flow of uniform grading. The material was actually on the sandy side of the grading specifications, but it was considered entirely satisfactory for the stabilized-base aggregate.

A 24-inch belt conveyor brought the gravel from the tunnel into the dryer of the asphalt plant. A few of the larger stones were removed from this belt by hand, but there was no pre-screening.

Hot-mix plant

The hot plant was a combination of Warren and Madsen units, which were combined into an efficient setup. The 58-inch×30-foot dryer, fired with heavy fuel oil through steam jet burners, kept pace with the 6,000-pound-batch pugmill. The plant gradation unit was set to reject all rock over 1 inch and separate the rest into two sizes. Fines removed in the dryer were picked up in the dust collector and returned to the boot of the hot elevator. Since only about 1 per cent of minus 200 material was required, some of the fines were wasted out the stack.

The 120 to 150-penetration asphalt for the mix was supplied by Douglas Oil Co. and trucked from Portland to the plant storage tanks. The three tanks, with a total capacity of 24,000 gallons, were heated by steam from a Kewanee oil-burning boiler.

A Caterpillar D342 diesel engine drove the plant pugmill. All other units of the setup were electrically operated with power supplied by a pair of Cat D13000 diesel-generator sets.

Since the plant was conveniently located and the job was short, a few hired trucks easily handled the haul. Most of these had 6-yard boxes and hauled three batches per load. All

(Continued from preceding page)

loads were weighed on a Winslow 25-ton portable truck scale.

Laid in three courses

Before starting the paving, the contractor bladed and compacted the grade. After a thorough watering, the surface was rolled by a Ferguson SP-10 rubber-tire roller. The first course of the asphalt-stabilized base was applied directly on this grade without a prime.

A Barber-Greene finisher laid down the 2½-inch first course and the succeeding 2-inch and 1½-inch courses to make up the total depth of 6 inches. A Buffalo-Springfield 3-wheel 10-ton roller made the breakdown pass and was followed by a Buffalo-Springfield 8-ton tandem roller. The final compaction of each course was done by a Ferguson SP-10, 9-wheel, 10-ton rubber-tire roller. The operator of the Ferguson used a small amount of Lux soap in his water tank as an aid in keeping the tires from picking up the mix.

After 6 inches of base had been laid, the contractor finished the surface with a double-penetration type of armor coating. An Etnyre distributor first applied a shot of 200 to 300-penetration asphalt. This was covered with a course of 1¼ to ¾-inch crushed stone, properly keyed. A second application of asphalt received an application of ¾ to ½-inch crushed material, plus ½ to ¼-inch filler. Then a third application of asphalt was covered with ½ to ¼-inch material and a filler ¼-inch to 10 mesh. A final seal of RS-2 emulsified asphalt covered with ¼-inch to 10 mesh completed the surface. All courses were thoroughly rolled by SP-10 and Buffalo-Springfield 10-ton 3-wheel rollers.

Personnel

The project was supervised for Warren Northwest, Inc., by superintendent V. H. Colvin, plant foreman H. D. Layton, and road foreman R. A. Meredith. For the Oregon State Highway Commission, John Gunter served as resident engineer and George E. Wood as road inspector. Division engineer Frank D. Morgan heads the Roseburg Division, in which the project was located. The assistant division engineer is L. R. Chandler. State construction engineer is Tom Edwards, and state highway engineer is W. C. Williams. THE END

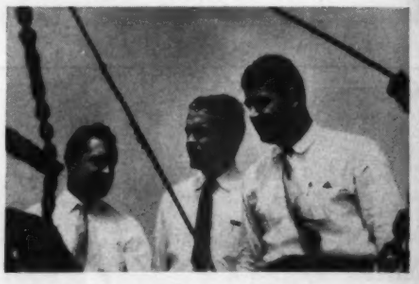
The six inches of paving goes down in 2½, 2 and 1½-inch courses. As the material is laid by a Barber-Greene finisher, a Buffalo-Springfield 3-wheel 10-ton roller makes the first pass.

Hartford Machine names

■ Jonathan F. Bushnell has been promoted to manager of the Midwest region for the Fuel Injection Division, Hartford Machine Screw Co., Hartford, Conn. William T. Lewis has been appointed sales and service representative of the Chicago area.

Detroit Diesel appoints

■ Robert B. MacArthur has been appointed general parts manager of the Detroit Diesel Engine Division, General Motors Corp., Detroit. He succeeds John Ball, who has retired.



Dragline gets inspection from Keith Hutchison, Greer vice president and technical director, Phil Owen and Chuck Daub (l. to r.). Owen and Daub are Standard Oil lubrication specialists who render the school technical assistance on lubrication problems. Both have engineering degrees and both have completed Standard's Sales Engineering School. Daub has ten, Owen five years of field experience serving commercial customers.

Standard Oil helps this school teach men how to keep a construction job going

Hutchison, Owen and instructor John Rolando watch student load 17-yard off-highway dirt hauler, one of school's 26 units.

ON ONE OF THE LARGEST EXCAVATION jobs in New Jersey's history, an International TD-24 crawler grades rock dumped by an International Model 95 Payhauler for part of a 5-mile stretch of construction of Interstate I-78 in Hunterdon County. Yonkers Contracting Co., Yonkers, N. Y., holds the contract for 3,600,000 cubic yards of excavation and all construction except paving. The right-of-way follows a rolling terrain that required cuts up to 127 feet deep.

reer Excavating and Mechanics School has learned one of the essons it teaches—how to keep equipment in service

ituation: Time is money at Greer Excavating d Mechanics School, Braidwood, Illinois. The hool promises its students hours of experience perating equipment. It teaches them how to aintain and service the machinery they work ith. It also teaches the men how important it is o do the job right and on time.

p to 70 students, guided by nine experienced structors, work 26 pieces of equipment almost very daylight hour, seven days a week, winter d summer. Bulldozers, scrapers, trucks, shovels d draglines *must stay in service* in spite of the ugged treatment they get.

hat was done: From the first day of school ore than three years ago, Greer Institute's quipment has been serviced exclusively with Standard Oil gasoline, diesel fuel, motor oil and greases. No unit has ever been down due to lubrication failure or because of slow delivery. How come? Because Phil Owen, an experienced Standard Oil lubrication specialist from Joliet, just 20 miles from the school, makes regular calls to check out any lubrication problem. From Wilmington, only 5 miles away, Standard Oil agent R. J. Kavanagh makes deliveries of gasoline, diesel fuel, lube oil and grease as often as every other day. The school never needs to telephone for service.

What you can do: To get this kind of service call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write, **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

You expect more from STANDARD *and you get it!*

Plenty of dirt to work with. School site is on 1,700 acre tract that has been ripped, torn and piled as result of strip mining. Greer instructor, John Rolando teaches student how to use skid shovel.

L-W grader, maintenance schools in U. S., Canada

■ Service schools conducted by Le-Tourneau-Westinghouse Co., Peoria, Ill., will be held in parts of the United States and Canada for the service staffs of contractors, counties, municipalities, and heavy-equipment users.

Schools for equipment maintenance procedures will be held in the following western locations: March 7-9, Vancouver Equipment Co., Vancouver, B. C., Canada; March 21-23, The Loggers & Contractors Machinery Co., Portland; March 28-30, Toole Corp., Seattle; March 28-30, Blakemore Equipment Co., Oakland; April 11-13, Crook Co., Los Angeles; April 18-20, Road Machinery Co., Phoenix; and April 18-20, Contractors Equipment & Supply, Albuquerque.

A series of motor-grader maintenance schools will be held in the central and eastern United States and eastern Canada: March 21-22, Illinois Contractors, Elmhurst, Ill.; March 24-25, Telford Equipment Co., Detroit; March 29-30, Columbus Equipment Co., Columbus; April 4-5, Walsh Equipment Co., Butler, Pa.; April 11-12, Equipment Sales & Service, Toronto, Ont.; April 14-15, Le-Tourneau-Westinghouse plant, Paris, Ont.; April 19-20, Automotive Products Co., Montreal, Que.; April 25-26, Field Machinery Co., Cambridge, Mass.; April 28-29, Hodge & Hammond, Inc., New York City; May 5-6, Machinery, Inc., Charleston, W. Va.; and May 9-10, Contractors Equipment Co., Lexington, Ky.

C. I. T. opens new office

■ An Oklahoma division office at 203 Park Ave., Oklahoma City, has been opened by C.I.T. Corp., New York, N. Y. Earl E. Garrett, assistant vice president and division head, will supervise the new division. He will be assisted by J. A. Eldridge, division operations head. Field representatives are R. L. Oliver and D. S. Reynolds.

Simplex names director

■ J. Arthur Jenkisson has been appointed director of sales for Simplex Forms System, Inc., Rockford, Ill. The post was recently created to expand sales and distribution of Simplex forms.

Davis Mfg. reorganizes; will offer new products

■ Davis Mfg., Inc., has returned to the construction-machinery field. The new wholly owned corporation has headquarters at 1500 McLean Blvd., Wichita, Kans. Products will be self-propelled and self-powered units; a small trenching machine is already on the market with a larger model in preparation. All equipment distributors, still in business, that distributed products of the old firm have signed up to distribute for the new firm.

Officers of the new firm are Charles J. Davis, president; Erwin Davis, vice president of marketing; Loren Hill, secretary-treasurer; and Ben Carpenter, vice president of manufacturing.

←For more facts, circle No. 298

Grass cover was grown successfully on steep clay slopes along a relocated Mississippi highway after agricultural limestone, shoveled onto the bank by hand, neutralized the acid in the soil. This Oliver OC-4 tractor pulls an offset disk harrow to break up the hard clay after the application.

Lime treatme

Growing grass on steep clay slopes is almost as tough as growing hair on a bald man's head, but a contractor did it on a Mississippi highway project.

The success of the seeding was due, in part, to the slopes being treated with agricultural limestone. This "sweetened" the soil and made a more suitable bed for the seed. No topsoil was required on the slopes. In effect, the agricultural limestone neutralized the acid in the soil. While the contractor was not too successful in reducing the acidity on a few of the slopes, the grass came up satisfactorily along the rest of the project.

By using modern machinery and a spray type of seeding, Bob Lancaster & Co., Duck Hill, Miss., was able to seed the backslopes at a minimum cost.

The work was done on the relocation of 7½ miles of State Highway 3

After the clay and agricultural limestone have been mixed, a Finn HydroSeeder on a Reo truck comes along to spray the slope with a mixture of seed and fertilizer.

Straw and emulsified asphalt is blown into place by a Finn mulch spreader. A White flat-bed truck carries the bales of straw and pulls the mulching machine and asphalt tank trailer.

Straw is fed into the blower from the left, and emulsified asphalt, under pressure, is sprayed onto the straw near the muzzle of the blower. The asphalt holds the straw together.

If you use rear-dump hauler

Backed by better than 25 years of specialized experience in building off-highway earthmoving equipment exclusively, Euclid's modern rear-dump line incorporates advanced engineering that is a result of unmatched field experience. From the 10-ton Model R-10 to the big 55-ton "Euc" with two engines and a total of 672 h.p., Euclid Rear-Dumps are job proved to meet today's requirements for big performance. This greater dimension... in range of capacities, in choice of engines, transmissions and tire sizes, and in type of hauler... and in parts and service facilities of a world-wide dealer organization, too... can mean lower hauling costs and more work-ability on every one of your rear-dump jobs.

Have the Euclid dealer in your area give you facts and figures to compare with your own hauling costs... you'll find Euclid's greater dimension pays off in a better return on your investment. EUCLID Division of General Motors • Cleveland 17, Ohio

Payload capacities of 10, 15, 18, 22, 27, 40 and 55 tons... also semi-trailer models of 12, 22, 35 and 50 ton capacity.

When you compare Rear-Dump Haulers, check these 7 points...

- is maker experienced in the field... known for building a dependable, well-engineered product?
- does machine have required performance ability needed... capacity and speed for high production work, power and traction for rough going and steep grades?
- well-balanced for size of loading equipment... hoppers and controlled dumping needs?
- is there good parts and service availability... at both manufacturer and dealer level?
- are maintenance manuals, parts books and service literature complete... is machine designed for easy servicing?
- is machine easy to operate... convenient controls... good visibility... operator comfortable so that efficiency is maintained for entire shift?
- can required production be maintained at low cost... construction rugged enough to withstand heavy service with minimum maintenance?

Euclid Rear-Dumps meet every one of these important requirements... and more!

ds seeding of steep clay slopes

from Meridian, north. Cobb Bros. Construction Co., Inc., of that same city, the general contractor, was building a 24-foot plant-mix roadway resting on an 8-inch soil-cement base. Beneath the soil cement was 10 to 15 inches of select sandy material.

Since future plans call for the addition of two extra lanes, only the backslopes on one side of the highway were seeded. The steep 2 to 1 backslopes looked mighty hostile to receiving a grass cover. Generally, the material was a red clay, although in the deeper cuts it became a hard gray clay almost like shale.

With the odds apparently against him, the contractor moved his equipment onto the job and went to work. The first step in the seeding was to spread the agricultural limestone. This was strictly a hand job. Men shoveled the bulk material from a truck and spread it on the slope. About two tons of the limestone dust was used to the acre.

The slopes were next processed with a disk harrow to a depth of about 4 inches. This mixed the lime with the clay and broke up the material. An Oliver OC-4 tractor pulling an International offset disk harrow did a good job of maneuvering on the steep slopes.

With the seed bed prepared, a liquid mixture of seed and fertilizer was sprayed on the slopes. A thousand gallons of water was mixed with 103 pounds of grass seed, 700 pounds of 10-20-10 fertilizer, and 200 pounds of ammonium nitrate. This quantity was sufficient to cover one acre.

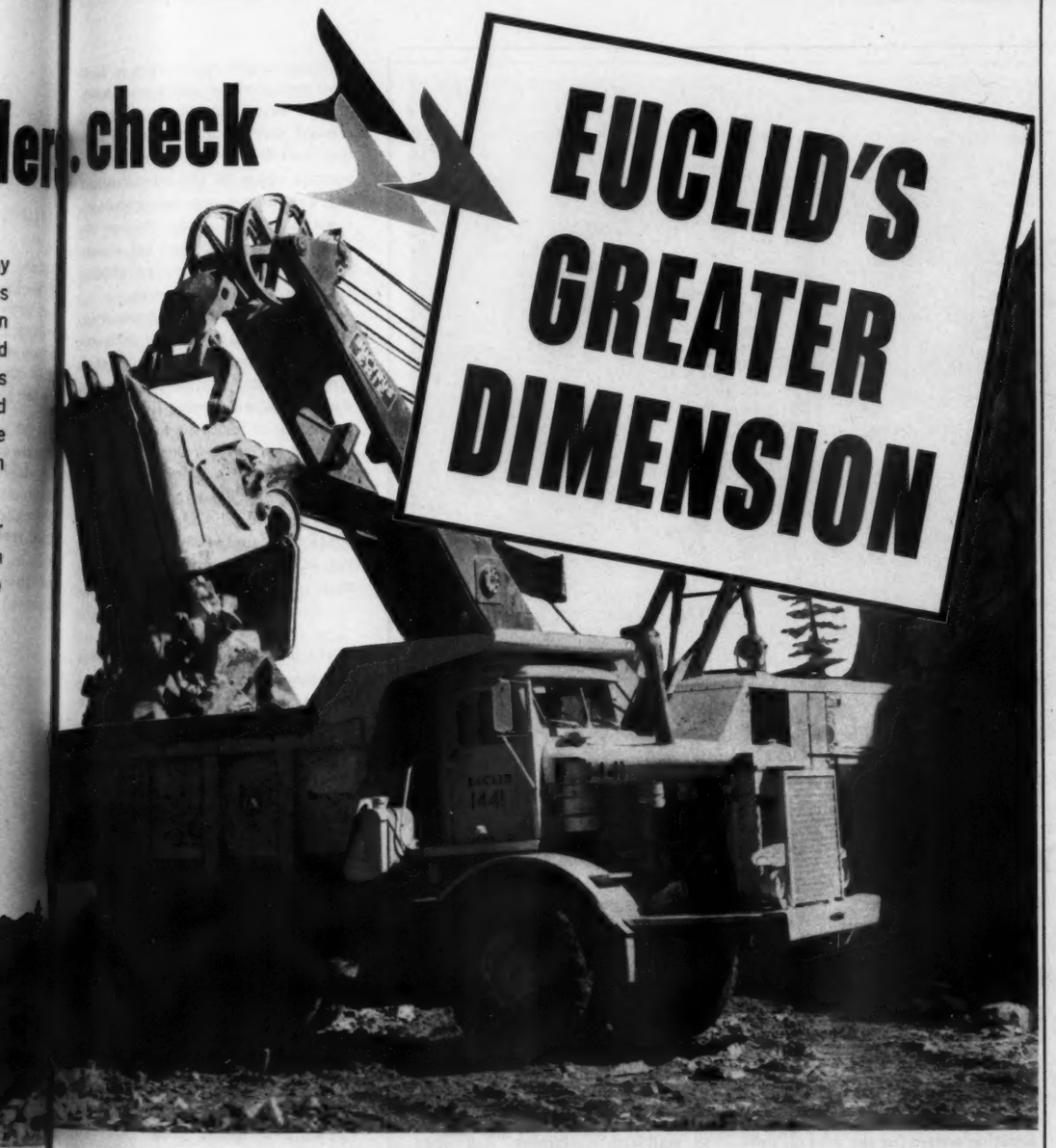
The mixture was sprayed from a Finn HydroSeeder mounted on a Reo truck. As the truck moved slowly down the shoulder, a man on the rig directed the spray. Generally, two passes were made to cover a single slope.

Soon after the slopes were seeded, they were covered with mulch. The oat-straw mulch retained the moisture and protected the seed. The mulch was sprayed on the slope with a Finn mulch spreader. To make the dry mulch cling together, emulsified asphalt was sprayed into the straw near the muzzle of the "gun" on the Finn mulch spreader. Two tons of mulch and 200 gallons of asphalt were required per acre. A white flatbed truck, carrying the bales of straw, pulled the Finn mulch spreader, which, in turn, pulled a 1,050-gallon tank trailer containing the emulsified asphalt.

The seeding of the embankment slopes, handled by another contractor, was done by a different method. It was spot-sodded by hand with clumps of Bermuda grass. The clumps of sod were placed at about 1-foot intervals in furrows that were 1 foot apart. Fertilizer was used to encourage the growth of the grass.

Devere Lancaster superintended the job for Bob Lancaster & Co. For the state highway department, F. A. Bellina was the project engineer. His assistant was D. B. Rainer.

THE END



BIG POWER . . . BIG CAPACITY . . . BIG PERFORMANCE

Model R-27 has heaped capacity of 26½ yds. . . . rated payload is 54,000 lbs. . . . available with Cummins 335 h.p. or GM 336 h.p. engine . . . 4-speed Torqmatic Drive with converter lock-up and Torqmatic Brake . . . dual hydraulic booster steering . . . 18.00 x 25 tires on all wheels . . . rugged body with twin hoists . . . top speed with full payload, 34 mph. . . . available in two body types, standard for all-around use and quarry for hauling big rock.

ENGINEERED FOR EASY SERVICING

Like other Euclids, the R-27 is of simple, rugged design for years of dependable performance at minimum maintenance cost. When repair or replacement of major components is necessary, service-minded engineering saves time and money, too. For example, a transmission can be removed and replaced in just one-eighth the time required for the same work on a competitive hauler of the same capacity . . . engine replacement takes only one-half as many man-hours.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Leschen names engineer

■ Anthony J. Abruzzo has been appointed prestress engineer for Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis. He will be responsible for assisting producers of prestressed concrete in the East with their engineering problems.

Galion Iron Works names

■ Charles W. Hedden has been appointed a district manager for The Galion Iron Works & Mfg. Co., Galion, Ohio. He will cover Kentucky, Tennessee, Georgia, Alabama, and Mississippi.

Lincoln Electric news

■ A new district office has been established in Washington, D. C., by The Lincoln Electric Co., Cleveland. William P. Douglas, field welding engineer, is the district manager.

Union Metal names

■ Harry deR. Gibbons has been appointed assistant manager of piling sales and engineering for The Union Metal Mfg. Co., Canton, Ohio.

←For more facts, circle No. 299

Ready-mix concrete is chuted between 8-inch roadway forms for the base of the concrete barrier along U. S. 1 in New Jersey. The old 12-foot median was removed, and excavation was carried down about 13 inches so that subbase and plant-mix could be placed.

Design changes lower road's modernization cost

Safety barrier offset so that only one shoulder has to be rebuilt along heavily traveled U. S. 1

Reconstruction of 19 miles of U. S. 1 between Trenton and a point south of New Brunswick, N. J., means increased safety for the motorists on this heavily traveled artery. An important phase of the reconstruction is the reinforced-concrete center barrier that now separates the new 27-foot roadways and that has already reduced the number of fatalities caused by head-on collisions.

Since 1954, the New Jersey State Highway Department has been engaged in a reconstruction program on busy outmoded routes. The program, which does not involve the complete rebuilding or relocation of the routes, depends on several design features. These include the center barrier, creeper lanes, jug handles, stabilized and widened shoulders, outer-edge white lines, overpasses, and the closing of existing center-island crossings.

Concrete barrier

The backbone of this rehabilitation program is the concrete center barrier. At most of the locations where the collision rate is high, the median strip was nonexistent or so narrow that it provided little or no protection for today's high-powered automobiles. And the extent of roadside development was so great that the addition of new highway lanes to permit widening of the median was not economically feasible.

Median replaced

Along this project, U. S. 1 consisted of two 25-foot concrete roadways, separated by a 12-foot median and flanked by 5-foot outside shoulders. On this project, the 12-foot, raised, grassed median strip was replaced by a 2-foot-2-inch-high concrete barrier.

The new design called for two 27-foot asphaltic-concrete roadways, separated by the barrier, with 10-foot macadam outside shoulders. One of the first operations on the job was the removal of the grassed median strip down to a point about 13 inches below the existing roadway surfaces.

This area was backfilled with 8 inches of crushed rock and compacted to form the subbase. Four inches of plant-mix was laid in two 2-inch lifts to form a base for the concrete barrier. The use of bituminous-mix base instead of the originally pro-

Geared by Fuller with off-highway '1220 Series Transmission . . .

Faster work cycles with countershaft brake and longer life with pressure filtration system

Eight Allis-Chalmers TS-260 Scrapers with Fuller off-highway '1220 Series Transmissions are boosting profits for Ben Haskins Construction Company on Oklahoma highway projects. All 8 of Haskins' '1220 Series Transmissions are equipped with Air-Powered Countershaft Inertia Brakes and Pressure Filtration Systems for the gear oil.

President Ben Haskins says, "Fuller '1220 Transmissions have helped make our operation more profitable. They're trouble-free. The transmission countershaft inertia brake permits quick, easy upshifts without double clutching. Faster shifting gives us faster work cycles . . . the pressure filtration system for the gear oil prolongs gear and bearing life . . . I'll insist on both the brake and the pressure filtration system when I buy equipment in the future."

For long life, easy shifting and positive lubrication in your scraper operations, specify Fuller off-highway Transmissions which include the countershaft inertia brake and pressure lubrication and filtration systems as standard equipment. Ask your dealer about these new features designed to provide *you* with a better margin of profit.

FULLER — TRANSMISSION DIVISION — MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.
Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

For more facts, use Request Card at page 18 and circle No. 300

Prefabricated forms are used to build the barrier to its 2-foot-2-inch height. A stiff mix is going into the forms. Use of this concrete saved on the white-pigmented concrete needed for the exterior of the barrier.

An International Vibro-Tamper compacts base for a shoulder. The bituminous base for the shoulder was topped with binder and wearing courses for its full 10-foot width. Completion of this section provides 27-foot roadways.

posed macadam curb base made it possible for contractors to install the bases during the winter.

Concrete barrier base

Eight-inch steel roadway forms were positioned on 1-inch fillers for the 2½-foot-wide barrier base. The forms were held in place by form stakes driven into the bituminous base course. The 2½-foot-wide barrier-base center line was offset about 2 feet from the median center line, so that it was positioned closer to the existing northbound roadway. This was done to facilitate the shoulder construction.

Most existing shoulders were 5 feet wide; to extend them to the desired 10 feet would have required excavating 7 inches down and backfilling with either crushed stone or bituminous-mix base material. Since this would have required the use of excavating equipment on both sides of the already restricted roadway, the highway department modified its shoulder construction procedures.

By offsetting the barrier, the contractors had to rebuild only the northbound roadway shoulder. The existing 5-foot shoulder was scarified, about 3 inches of material removed, and an additional 5-foot extension was made to form the 10-foot shoulder. After compaction, the 10-foot strip was topped with 3 inches of bituminous concrete to form the shoulder base.

All that was necessary to build the southbound roadway shoulder was the scarifying and removal of 3 inches of material from the existing 5-foot shoulder. This area was then backfilled with 3 inches of bituminous mix. Five feet of the existing southbound roadway slab was incorporated in the shoulder to bring its width to 10 feet. Both northbound and southbound shoulders were completed by topping the bituminous base with binder and wearing courses.

Barrier completed

Prefabricated steel forms were clamped atop the 8-inch barrier-base forms to complete the barrier. Ready-mix concrete was dumped directly from transit-mix trucks into the tapered formwork. The stiff mix was then shaped inside the forms with

(*Continued on page 77*)

When this photograph was taken, 8,000 yards of right-of-way had been cleared of trees, and the roadbed was being prepared for surfacing.

"Sinclair Helped Cut Maintenance Costs On Every Mile of Our Northway Section"

says J. Hanna, Superintendent,
D. A. Collins Construction Company

The Northway, another link in the nation's grid of superhighways, connects the New York State Thruway with the Canadian border. Mr. Hanna says, "Our heavy-duty equipment took the toughest kind of punishment on this project. Work ranged from ripping out trees to building bridges. Yet our maintenance costs were far below what we anticipated. Much of the credit must go to Sinclair's service and their high quality fuels and lubricants. They kept our equipment operating at peak efficiency . . . *on schedule*. These are reasons enough why we use Sinclair Products exclusively."

If you haven't discovered the cost-cutting possibilities of Sinclair services and products, see your local Sinclair Supplier — or write Sinclair Refining Company, Contractor Sales Dept., 600 Fifth Avenue, New York 20, N. Y.

Sinclair
Fuels and Lubricants

Sinclair

Mr. Hanna reports, "The portable trailer tanks Sinclair loaned to us contributed greatly to the speed and efficiency on our section. We were able to refuel on the job . . . **fast**, and keep our equipment working **full time**."

For more facts, use Request Card at page 18 and circle No. 301

HYPERBOLIC PARABOLOID ROOFS

are poured faster with a high-lift, long-reach

ECONMOBILE

33 feet up with crane boom and 19½ feet in reach

Jobsite concrete pouring today requires more height and reach than ever before, just because of jobs like newly designed hyperbolic paraboloid roofs. That's one reason why more ECONMOBILES have been sold than any comparable vehicle. And you get plenty of muscle too—4000 lb. capacity and a vehicle built from the ground up (not a conversion) for nimble jobsite materials handling.

Whether it's concrete pouring, bricks, mortar, tile, beams, clean-up, almost any job—hundreds of users have found it a full time machine.

Cost? Give us the wages of two general laborers for one year — we'll give you an ECONMOBILE.

Available in two Models: King Size 620 and Std. Size 600.

Econmobiles are the jobsite's most experienced vehicle

AMERICAN ROAD EQUIPMENT CO. *4201 North 26th Street, Omaha, Nebraska*

For more facts, use Request Card at page 18 and circle No. 302

(Continued from page 75)

hand shovels to provide enough area for the exterior white-pigmented concrete. This shaping of the regular concrete reduced the quantity of white concrete needed to complete the barrier.

After the forms were stripped and the barriers completed for the contract sections, the asphaltic-concrete binder and wearing surfaces were placed. Before the 2-inch binder course was placed, the remaining 3 inches of bituminous-mix base had to be laid on both sides of the barrier to bring the median strip up to the level of the existing roadway slabs. The two 27-foot roadways were then paved; the 2 inches of binder material was topped with 1½ inches of wearing surface.

Contractors

Kingston Bituminous Products Co., Kingston, N. J., had three contracts totaling $2,829,000 for about 13 miles. Brann & Stuart Co., Trenton, N. J., had a 3-mile section under a $876,508 contract. A. J. Cunningham & Son, Trenton, had a $870,275 contract for a 2.9-mile section. Hess Bros., Parlin, N. J., handled miscellaneous construction along the project, which involved $232,560 in contracts. THE END

Twelve projects proposed for ASCE 1959 award

■ Twelve civil engineering projects have been nominated for the Outstanding Civil Engineering Achievement of 1959, awarded by the American Society of Civil Engineers. The winner will be announced at the society's annual convention this month in New Orleans.

Nominated projects are the Allegheny (Pa.) County sewage-disposal system; Executive House, Chicago; Glen Canyon Bridge; Oahe Dam; Oak Street connector in New Haven, Conn.; Priest Rapids Dam; the St. Lawrence Project; Scioto Downs race track near Columbus, Ohio; Torresdale (Pa.) water-treatment plant; Vandenberg Air Force Base; the Wichita-Valley Center flood-control project; and Wilson Lock in Wilson Dam at Muscle Shoals, Ala.

PCI moves headquarters

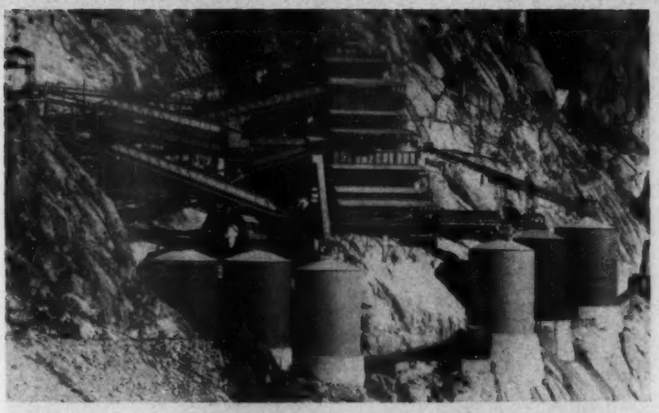
■ The Prestressed Concrete Institute has moved from Boca Raton, Fla., to 205 W. Wacker Drive, Chicago. The new headquarters will maintain an up-to-date library and will serve as liaison for the exchange of information, research, and new methods between members.

New officers of the PCI are: president, Randall M. Dubois; vice president, Jacob O. Whitlock; and secretary-treasurer, Charles L. Scott, Jr.

American Cyanamid news

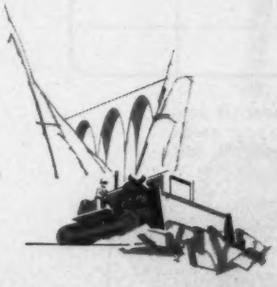
■ George P. Ferrigni has been named assistant manager of the project engineering department of the Engineering & Construction Division, American Cyanamid Co., New York City.

For more facts, circle No. 303→



CLINGING TO A PYRENEES MOUNTAINSIDE in northwestern Spain, this aggregate plant will supply over 1 million cubic yards of concrete for the Salto de Aldeadavela Dam. The plant is equipped with a 60×48-inch A-1 jaw crusher, a 24×60 Superior gyratory crusher furnished by Allis-Chalmers International, and twelve 6×16-foot Ripl-Flo vibrating screens that were furnished by Allis-Chalmers Great Britain Ltd.

*IN ANY 4-CYCLE ENGINE AT 3000 RPM



You can't see the hammer-like blows piston rings receive, but costly results are soon evident when inferior material is used.

Correct metallurgy is one of the most important features of every Perfect Circle piston ring. Over six different metals are used at Perfect Circle...each material the highest strength compatible with the specific application...each material selected for utmost protection against breakage.

Correct, proven metallurgy is another reason why Perfect Circles are preferred and installed with confidence by leading engine manufacturers and mechanics everywhere.

PERFECT CIRCLE

PISTON RINGS • PRECISION CASTINGS • POWER SERVICE PRODUCTS • SPEEDOSTAT

HAGERSTOWN, INDIANA • DON MILLS, ONTARIO, CANADA

Dual repair shops serve rock spread

This FWD truck, fitted with Hiab hoist and carrying its own compressor, is one of two special rigs kept on the project by Goodyear Tire Co., Salt Lake City, which handled tire service for the job. Goodyear took care of the 348 huge 18.00×33 tires on the "Eucs," as well as many smaller tires. Since haul roads are almost 100 per cent rock, tire servicemen check all tires four times daily.

Maintaining the layout of giant-size machines used by Western Contracting Corp. on an 8-million-yard rock-stripping job, in Kennecott Copper Co.'s Bingham mine near Salt Lake City, Utah, called for two repair shops as well as dual lubrication, fueling, and tire-maintenance setups.

Under the over-all supervision of master mechanic Ray Nicholson, complete maintenance setups were established on both the east and west sides of the pit to service the spreads that worked in these areas. The shops were insulated Armco and Stran-Steel buildings heated electrically, with power supplied from the mine.

These were unusual equipment spreads because most of the units were very large. The layout included Western's huge 80-yard truck-trailer, which is said to be the world's largest truck. (See page 128.) Other units were 33 Euclid LLD 50-ton end-dumps, two Bucyrus-Erie 50-R drills, two Marion 13-yard Model 191-M shovels, five Cat D9 dozers, and accompanying smaller machines.

Hard rock causes wear

The hard rock that broke into sharp fragments caused severe wear on shovel dippers and truck beds and was a constant menace to the tires of the haul rigs.

To eliminate the excessive bucket wear on the big shovels, the maintenance crew faced the wear areas of the buckets with strips of Jalloy 3, a hard, abrasive-resistant steel alloy supplied by Paper, Calmenson & Co., St. Paul, Minn. Strips of the Jalloy 3, measuring 4 inches wide and ¾ inch thick, were welded with a low-hydrogen rod to the sides and bottom of the bucket. The strips were spaced 2 inches apart and placed transverse to the flow of materials through the bucket.

Strips of this same material corrected a similar wear problem that developed in the bottoms of the truck boxes. Here the ¾×4-inch strips were first spaced 6 inches apart running longitudinally on the truck boxes. Since the 6-inch space between the bars continued to show excessive wear, additional strips were welded in the spaces. This left only a 1-inch space between strips and solved the wear problem.

Checklist for Dredge Selection

Successful dredging operations require efficient use of time and labor, avoidance of downtime, and all-around capability of a dredge backed up by a builder of recognized merit. Before you buy a dredge, be certain that the builder qualifies on all of the following points. You must be assured that he has complete responsibility for the performance of your equipment.

	ELLICOTT	BUILDER A	BUILDER B
Is the dredge a 100% unified machine, designed and built by a single engineering source?	✓		
Does the builder *integrate* all the parts into a *balanced* construction tool?	✓		
Can he assure the performance potential of the completed dredge?	✓		
Are his equipment recommendations based on your specific job requirements?	✓		
Is he willing to take *complete* responsibility for field performance?	✓		

Come to Ellicott first for real evaluation of the factors you must consider—in your own interest—to insure a sound investment in the dredge best suited to your needs. Write to Ellicott Machine Corporation, 1609 Bush Street, Baltimore 30, Md.

ELLICOTT DREDGES

ELLICOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragues Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico; Ellicott Fabricators, Inc., Baltimore, Maryland; McConway & Torley Corporation, Pittsburgh, Pennsylvania.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering, design and construction services.

9017

For more facts, use Request Card at page 18 and circle No. 304

This 5-stall shop, a 60×100-foot insulated Armco metal building, is one of two field shops servicing equipment during the work of enlarging the huge open-pit copper mine near Bingham, Utah.

Well stocked parts trailers, carrying the most commonly needed parts, are parked near the shop buildings. Trailers are labeled with the type of machine for which it carries parts.

Servicing the big tires

The fleet of haul units carried 348 tires, all of the 18.00×33-inch size, weighing some 1,500 pounds each and costing approximately $2,800 apiece. The maintenance of these and the other tires in the spread was handled by the Goodyear Tire Co., Salt Lake City, Utah.

All of the tires were checked four times during each 20-hour day for rocks, cuts, and flats. When a change was necessary, the Goodyear crew was well equipped to do it speedily. Two big rigs were kept on the job at all times. These were FWD trucks equipped with Hiab hydraulic hoists and carrying their own compressors and all necessary tools and equipment.

To lift the big haul rigs for tire changes, the crew used Hein-Werner 50-ton hydraulic jacks. Ingersoll-Rand air wrenches speeded the removal and replacing of lug nuts while the hydraulic hoist did the lifting. With this combination, front tires were changed in 20 to 30 minutes, outside duals in 30 to 45 minutes, and inside duals in 60 to 90 minutes.

New tires installed on this job were all Goodyear Hard Rock Lug XT (extra tread) type. On recommendation by the tire crew, worn tires were recapped with the same type of tread.

Lubrication

A well planned lubrication program resulted in the lubrication and field servicing of each piece of equipment once during each 10-hour shift. The shovels and drills were serviced by the oilers who worked on them. Haul units were pulled in, one at a time, during the working hours and lubricated and fueled at special stands on the two spreads.

A mobile lube rig mounted on an International 4×4 truck serviced the dozers, motor graders, and other machines in the field. This rig carried four Lincoln pumps and reels to dispense the several grades of lubricants required.

The spread on each side of the mine was supplied with fuel from three 10,000-gallon tanks fitted with electric dispensing pumps. Truck transports of fuel were delivered directly from the Salt Lake City refinery of the Standard Oil Co. of California. A 20,000-gallon tank on

(*Continued on next page*)

...ON A MILE-LONG BRIDGE BUILT BY YUBA

With plans well underway on major bridges at Buffalo, N.Y. and Knoxville, Tenn., Yuba Erectors recently started construction on another: the erection of sub- and super-structures of the high-level Martinez-Benicia Bridge across upper San Francisco Bay.

Four lanes wide, 6215 feet long, and with a maximum height of 138 feet, this $14.3 million structure is scheduled for completion in 1962.

To complete the bridge on schedule and in record time, a habit with this fast-moving nationwide organization, Yuba Erectors will make full use of experience and skills gained in building such other notable structures as the Richmond-San Rafael and Glen Canyon bridges.

On these and other major projects, Yuba has developed advanced technologies and introduced specialized land and water equipment and procedures that solve scores of problems and expedite construction.

Bridge erection is but one phase of Yuba Erectors' operations. As a member of Yuba's diversified family, this division is backed by Yuba's fabricating plants—East and West—and can thus provide a wide range of services for all Yuba divisions in the heavy structural and mechanical fields. Call on Yuba, when you have a project in either field—wherever it may be located.

YUBA

specialists in structural and heavy mechanical erection—nationwide

YUBA ERECTORS

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YUBA CONSOLIDATED INDUSTRIES, INC.

Sales Offices in Atlanta • Buffalo • Chicago • Cleveland • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Seattle

For more facts, use Request Card at page 18 and circle No. 305

Lubrication and field servicing of each piece of equipment is done during each 10-hour shift on the project. While haul units are fueled and lubricated at special stands, dozers, motor graders, and other machines in the field are serviced by this mobile lube rig on an International 4×4. It carries four Lincoln pumps and reels to dispense lubricant.

(Continued from preceding page)

each side served for lube oil storage. All lubricants were supplied by Utah Oil Refining Co., Salt Lake City.

Preventive maintenance

Each of the "Eucs" got a 500-hour check in the shops. At this time, transmission and differential greases were changed and engines given a careful tuning. Truck operators and mechanics maintained a close liaison so that any troubles noticed by the drivers received the immediate attention of the mechanics. When ... master mechanic decided major ... hauls were necessary, the work ... done in the field shops.

The shop on the west side of ... pit was a 60×100-foot Armco ... building divided into five big stalls ... any one of which could easily take ... one of the LLD Euclids. Each stall had 20-foot-high doors to clear the big rigs. The shop on the east side, similar but smaller, was a Stran-Steel building measuring 60×60 feet and containing three stalls.

In addition to parts rooms in the shop buildings, Western's big parts trailers parked nearby carried a complete line of the most needed parts. Each of the trailers was labeled with the number of the machine for which it carried parts; one trailer, for example, was labeled LLD Parts, another 191-M Parts.

Both shop buildings were heated by electricity supplied at a nominal rate directly from the Kennecott Copper Co. power plant. This was a safe, clean, efficient heat that kept the shop buildings warm during the cold months.

A big factor in the quick handling of emergency service calls was the Motorola mobile-radio system. Three base stations were installed in the two shops and the field office. Six mobile sets were carried in the pick-ups of supervisory personnel. The rigs at work were almost never out of sight of a supervisor having a radio within his reach.

The efficiency of the maintenance setup was proved by the steady high production of the spreads. The two spreads moved 2,000 cubic yards of rock per hour, day in and day out, during the course of the 8-million-yard job.

Personnel

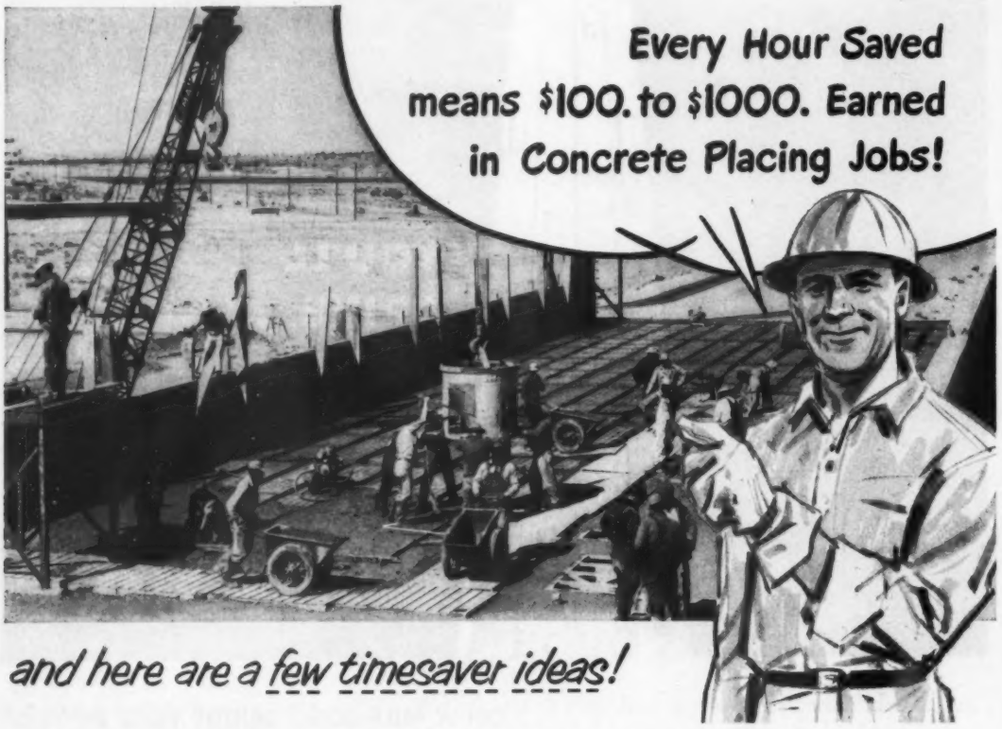
Master mechanic Ray Nicholson supervised the maintenance and repair operations on both sides of the job. R. E. Surprenant was supervisor for the Goodyear Tire Co. on the tire-servicing operation. T. E. "Tom" Speight was project manager for Western Contracting Corp.

THE END

Raymond award presented to engineering instructor

■ The second annual Alfred A. Raymond Award has been presented to M. T. Davisson, a civil engineering instructor at the University of Illinois. He received a $1,000 check and citation for a paper investigating the lateral stability of New York City's new Pier 40.

Raymond Concrete Pile Co., a division of Raymond International Inc., New York City, established the award in honor of its founder to encourage originality in research and development in foundation engineering.



Every Hour Saved means $100. to $1000. Earned in Concrete Placing Jobs!

and here are a few timesaver ideas!

Team up equipment to prevent delays which keep men idle—equipment costs are much less than lost man hours.

Use two or even three concrete buckets on a pouring job. While the crane spots one bucket and the concrete is being dumped, the other bucket can be filled, thus you can almost double output by eliminating waiting time between bucket loadings.

Accordion Hopper attachments on Gar-Bro Concrete Buckets guide concrete into narrow wall forms —prevent spillage and speed up the placing job.

When placing concrete in piers, use two or three collection hoppers with flexible steel drop chutes to direct concrete without segregation. Thus you can rotate the chute lines and shorten one line while the other is in use. This will eliminate delays of the bucket and crane and transit mix trucks.

Use Receiving Hoppers, either floor hoppers or portable hoppers for intermediary storage of concrete. Thus you keep a steady supply of concrete and prevent stoppage of the cart crew. At the same time you eliminate delays of transit mixers.

Supply your men with carts that are designed for handling concrete – Gar-Bro Concrete Carts – they are *balanced when fully loaded;* are easy to handle, easy to dump.

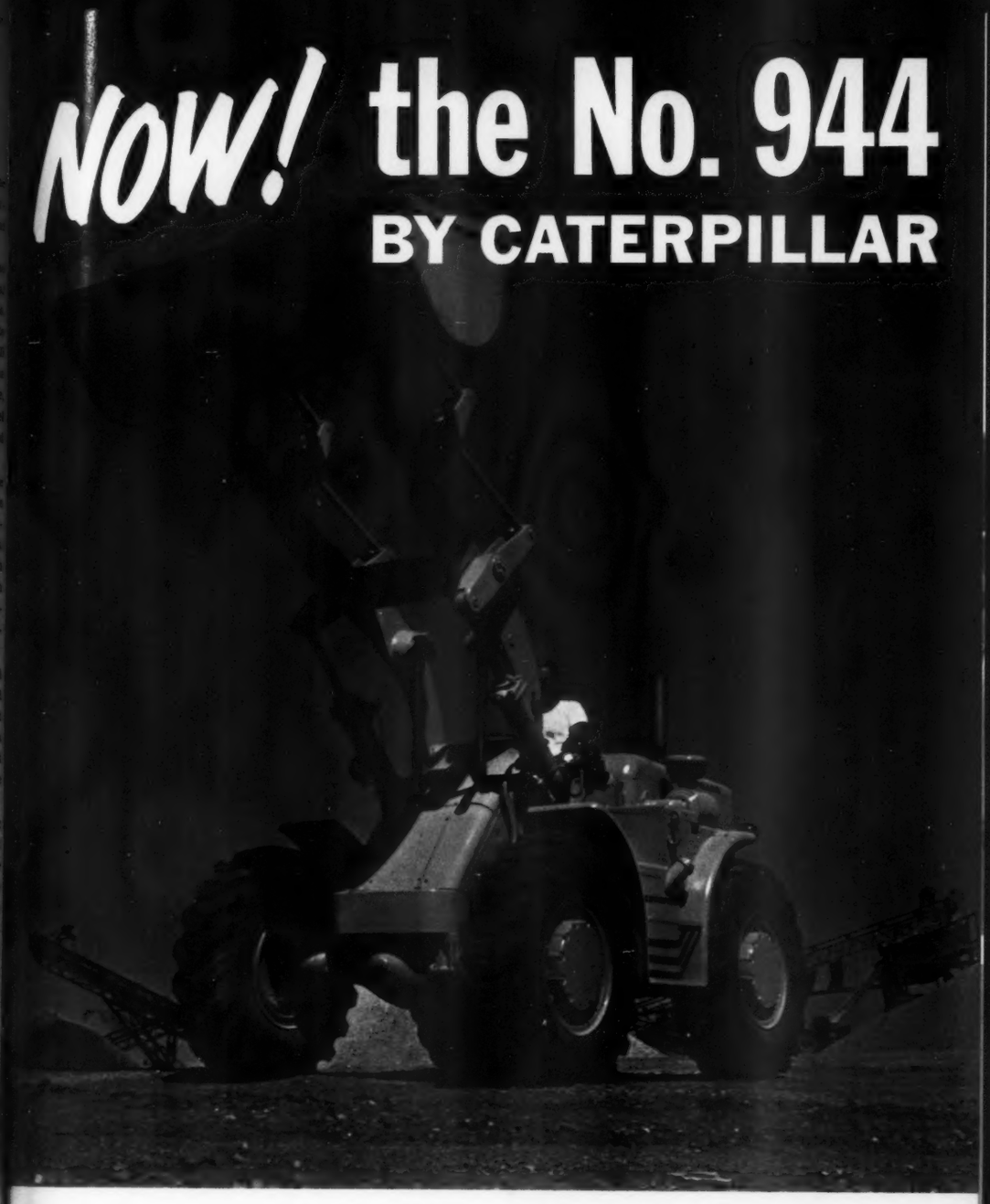
Concrete placing has become a science in the past ten years and, today, in the contracting business only careful planning and proper equipment can guarantee adequate profits.

See your Gar-Bro dealer for suggestions and methods of handling concrete or write for Gar-Bro's Concrete Handling Manual. **Gar-Bro Mfg. Co., Los Angeles, Calif. • Peoria, Ill.**
General Offices: 2415 E. Washington Blvd., Los Angeles 21, Calif.

GAR-BRO *The World's Most Complete Line of* **CONCRETE HANDLING EQUIPMENT**

For more facts, use Request Card at page 18 and circle No. 306

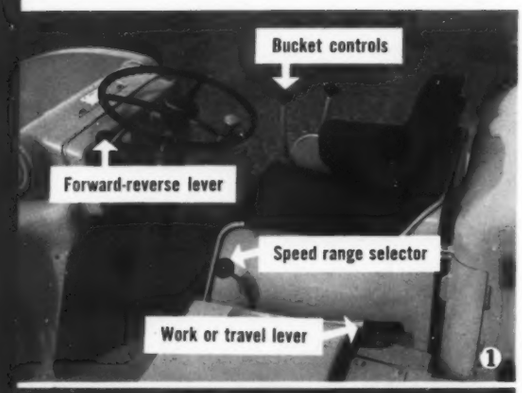
NOW! the No. 944
BY CATERPILLAR



THE *FIRST*
OF A NEW WHEEL LOADER LINE

the No. 944 T

...designed for action, sa



IT'S HERE . . . the Cat No. 944 . . . rated at 2 cu. yd. capacity . . . the first of a completely new line of equipment that will soon include the No. 922 (1¼ cu. yd. bucket) and the No. 966 (2½ cu. yd. bucket).

Watch for these new machines with the bold new design . . . they're ready to bring new standards to wheel loader operation.

Take a look at the No. 944's big, new features . . . features that give it lively response and make it the easiest and safest wheel loader to operate. See it in action at your Caterpillar Dealer. Ask him for a demonstration. See for yourself how the *new design* pays off on your loader jobs.

DESIGNED FOR ACTION . . . with plenty of power for both machine drive *and* bucket hydraulics. Choose from two great new engines . . . the compact 4-cylinder diesel, turbocharged for maximum efficiency . . . or the 6-cylinder gasoline engine. Both are 105 HP units, fully equipped. Both are made to the same rigid standards. Whatever the requirements of your operation, there's a No. 944 powered to meet your needs.

Tailored to this power is the torque converter and power shift transmission, providing smooth, instant, finger-tip shifting. A full range of work and travel speeds is available on the No. 944. And reverse speeds are 25% faster than forward speeds . . . important in reducing cycle times. Travel Range gives 2-wheel drive for roading . . . Work Range automatically puts power to all 4 wheels.

Machine and bucket controls are located for easy handling(1) —the forward-reverse lever is mounted on the steering column.

Both bucket control levers have kick-out devices. The lift control releases at dumping height—the tilt control positions the bucket for digging. And for full bucket loads every pass the 2 cu. yd. bucket tilts back 41° at ground level. The high lift and *extra-long reach* make truck loading faster, easier.

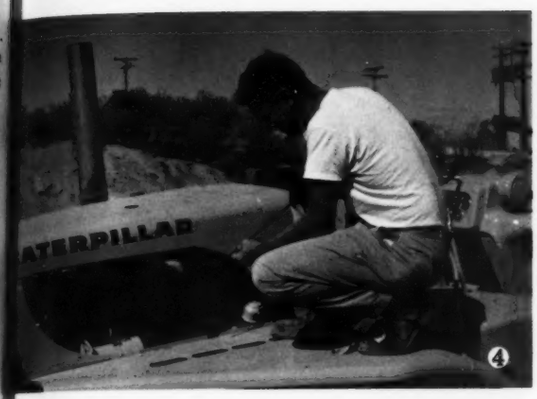
There's plenty of action designed into the No. 944, ready to speed up your loader jobs.

DESIGNED FOR SAFETY . . . in the bold new lines(2). Bucket lift arms and pivot points are completely in front of the operator's area. This gives the operator new freedom of movement . . . greater all-around visibility.

Wide steps(3) make it safe and easy to get on or off . . . from either side. No need to climb over tires. Fenders provide a handy platform for checking the engine and they protect the operator from rocks and mud(4).

The No. 944 brake system gives safer, more precise control(5). The *left* brake neutralizes the transmission *as* it stops the machine. This gives superior loading action in extra-tough material.

Traxcavator safety, economy



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5

The *right* brake leaves the transmission engaged . . . for full control when creeping, working on steep slopes or roading downhill.

These and other safety-bonus features give the No. 944 operator greater confidence, greater efficiency.

DESIGNED FOR ECONOMY . . . in the Caterpillar tradition. Sound engineering, modern design, service accessibility, quality construction, responsible parts and service coverage all add up to a new kind of stability—mechanical stability—in the No. 944. The many cost-saving features of this NEW wheel loader will pay off big in your operation!

Offered in a full line of versatile attachments and accessories are forks, cab(**6**) and special buckets, including the *exclusive side dump* that gives the No. 944 added efficiency.

6

BRIEF SPECIFICATIONS

Horsepower (Net)	105*
Bucket capacity	2 cu. yd.
Bucket reach (@ 7 ft. dump height)	50¾ in.
Over-all width (bucket)	93½ in.
Wheel base	88 in.
Speeds, forward (4)	0-24 MPH
reverse (4)	0-30 MPH
Weight, shipping (with diesel engine)	20,780 lb.
(with gasoline engine)	20,440 lb.

*For comparative purposes, the maximum rating of the D330 Engine used in the No. 944 is 135 horsepower.

THE No. 944 TRAXCAVATOR...
NEW IN DESIGN AND LOADED WITH PERFORMANCE

Learn more about it. Visit your Caterpillar Dealer the week of March 14

There's a wealth of LOADER KNOW-HOW behind the No. 944. It comes from the builders of the best accepted track-type tractor-shovels in the field.

Every feature is designed for *efficient work*. Plenty of horsepower . . . finger-tip shifting . . . smooth, fast bucket action . . . outstanding operator comfort and safety. The result is the bold, new No. 944 . . . the *outstanding* performer in its class!

For complete facts, see your Caterpillar Dealer now.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

A GREAT NEW PRODUCT IN THE CATERPILLAR TRADITION

Convention Calendar

March 7–11 American Society of Civil Engineers
Meeting, Jung Hotel, New Orleans, La. W. H. Wisely, executive secretary, ASCE, 33 W. 39th St., New York 18, N. Y.

March 8–9 Utah Highway Engineering Conference
Conference, Union Bldg., University of Utah, Salt Lake City, Utah. Preston D. Linford, chairman, Civil Engineering Department, UHEC, University of Utah, Salt Lake City 12, Utah.

March 14–15 Georgia Highway Conference
Conference, Architecture Auditorium, Georgia Institute of Technology, Atlanta, Ga. Richard Wiegand, director, GHC, Short Courses and Conferences, Georgia Institute of Technology, Atlanta 13, Ga.

March 14–17 American Concrete Institute
Fifty-sixth Annual Convention, Commodore Hotel, New York, N. Y. Charles L. Cousins, public relations director, ACI, P. O. Box 4754, Redford Station, Detroit 19, Mich.

March 14–18 National Association of Corrosion Engineers
Sixteenth Annual Conference and Corrosion Show, Memorial Auditorium, Dallas, Texas. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

March 16–18 Short Course for Superintendents and Operators of Water and Sewerage Systems
Twenty-third Annual Course, Louisiana State University, Baton Rouge, La. Fred H. Fenn, dean, College of Engineering, Louisiana State University, Baton Rouge 3, La.

March 17–27 International Construction Exhibition
Second International Exhibition, Palace of the National Industrial and Technical Center, Paris, France. Exhibition Secretariat, ICE, 1, venue Niel Paris, XVII, France.

March 20–26 American Congress on Surveying and Mapping and American Society of Photogrammetry
Meeting, Shoreham Hotel, Washington, D. C. C. E. Palmer, secretary-treasurer, ACSM-ASP, 1515 Massachusetts Ave. N.W., Washington 5, D. C.

March 21–24 Associated General Contractors of America, Inc.
Forty-first Annual Convention, Masonic Temple, San Francisco, Calif. James D. Marshall, executive director, AGC, 1957 E St. N.W., Washington 6, D. C.

March 23–25 Northwest Highway Engineering Conference
First Combined Conference of Northwest Conference on Road Building and the Northwest Traffic Engineering Conference, Oregon State College, Corvallis, Ore. G. S. Paxson, assistant state highway engineer, Oregon State Highway Department, Salem, Ore.

March 27–April 1 Greater New York Safety Council
Thirtieth Annual Safety Convention and Exposition, Hotel Statler, New York, N. Y. Paul F. Stricker, executive vice president, GNYSC, 60 E. 42nd St., New York 17, N. Y.

March 29–31 South Dakota Highway Short Course
Course, Union Bldg., South Dakota State College, Brookings, S. Dak. Emory E. Johnson, SDHSC, South Dakota State College, Brookings, S. Dak.

March 30–April 1 Assoc. of Highway Officials of the North Atlantic States
Thirty-sixth Annual Convention, Bellevue-Stratford Hotel, Philadelphia, Pa. Kenneth D. Rice, executive secretary, AHONAS, 1035 Parkway Ave., Trenton 25, N. J.

April 5–6 Earthmoving Industry Conference
Eleventh Annual Conference, Pere Marquette Hotel, Peoria, Ill., sponsored by the Central Illinois Section of the Society of Automotive Engineers. R. Lenich, publicity chairman, EIC, Box 973, Peoria, Ill.

April 5–7 Building Research Institute
Spring Conferences, Statler-Hilton Hotel, New York, N. Y. Harold Horowitz, assistant director for technical programs, BRI, 2101 Constitution Ave., Washington 25, D. C.

April 5–7 Ohio Highway Engineering Conference
Conference, Ohio Union, Ohio State University, Columbus, Ohio. Emmett H. Karrer, director of conference, Ohio State University, 190 W. 17th Ave., Columbus 10, Ohio.

April 6–8 New York State Association of Highway Engineers
Meeting, Hotel Syracuse, Syracuse, N. Y. Alfred Lyng, chairman, NYSAHE, 444 Van Duzee St., Watertown, N. Y.

April 18–21 Purdue Road School
School, Purdue Memorial Center, Purdue University, Lafayette, Ind. J. F. McLaughlin, associate professor of civil engineering, School of Civil Engineering, Purdue University, Lafayette, Ind.

April 25–29 American Welding Society
Forty-first Annual Convention and Welding Exposition, Biltmore Hotel and Great Western Exhibit Center, Los Angeles, Calif. Information Center, AWS, 33 W. 39th St., New York 18, N. Y.

April 28–30 Texas Aggregates Assoc. and Texas Ready Mix Concrete Assoc.
Meeting, Hilton Hotel, El Paso, Texas. Ray L. Cain, executive secretary, TAA-TRMCA, 201 Perry Brooks Bldg., Austin, Texas.

May 10–12 Highway Transportation Congress
Eighth Congress, Mayflower Hotel, Washington, D. C. Arthur C. Butler, director, National Highway Users Conference, HTC, 966 National Press Bldg., Washington 4, D. C.

May 19–20 Society of American Military Engineers
Annual Convention, Mayflower Hotel, Washington, D. C. Col. F. H. Kohloss, executive secretary, SAME, 808 Mills Bldg., Washington 6, D. C.

May 19–29 International Public Works and Building Equipment Exhibition
Second International Exhibition, Aeronautical Palace at Le Bourget Airport, Paris, France. Exhibition Secretariat, IPWBEE, 1, Avenue Niel, Paris XVII, France.

May 23–26 Design Engineering Show and Conference
Conference and Show, Coliseum, New York, N. Y. Banner & Greif, 369 Lexington Ave., New York 17, N. Y.

May 24–27 National Rivers and Harbors Congress
Meeting, Mayflower Hotel, Washington, D. C. William H. Webb, executive vice president, NRHC, 1028 Connecticut Ave. N.W., Washington 6, D. C.

May 30–31 Wire Reinforcement Institute
Annual Spring Meeting, The Greenbrier, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington 4, D. C.

January heavy-construction contracts totaled $1.3 billion.

Good as today's engines are, the cost of operation is a whale of a lot higher than it has to be if you're still using old-fashioned equipment with clutch pedal and clash-box.

For with a hydraulic drive – like Allison's TORQMATIC – you can free your engines from the shock-loads and strains which stick-shifts cause.

You see, TORQMATIC DRIVES extend engine life by virtually eliminating one of the main causes of engine wear – lugging. And they get more work out of an engine, too, because there's no power lag when the driver shifts.

SAVE MONEY AUTOMATICALLY

What's more, TORQMATIC eliminates all engine-disconnect clutch repairs – saving owners of big equipment an average of $800 a year in parts and labor. It saves up to $2,000 in equipment damage every time you train a rookie in operating big equipment – practically eliminates high repair bills for unavoidably shock-loaded drive lines and axles.

Just from the operating cost angle, the man with TORQMATIC advantages–who thinks about *total* cost, not just first cost – figures to head off a lot of competitors. Interested? See your equipment dealer today or write Allison.

Allison Division of General Motors
Indianapolis 6, Indiana

In Canada: General Motors Diesel Ltd., London, Ontario

Allison TORQMATIC®
DRIVES

THE MODERN DRIVE FOR MODERN EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 308

A Lima 1601 with 4-yard bucket, averaging close to 4,000 yards of rock excavation in two 9-hour shifts, loads blasted rock into Euclid rear-dumps for the haul to fill areas. The contractor put the shovel on the double shift, after ground conditions became favorable, to make up for time lost in bad weather.

Good spread makes grading job hum

By putting a shovel on a double shift to handle blasted rock and by increasing its scraper spread, Oman Construction Co., Nashville, Tenn., made good time on its grading job along a 4.4-mile section of Kentucky's Interstate 64. The contract is part of the new highway being built between Louisville and Lexington. Its alignment is on a completely new location running south of and parallel to U. S. 60.

Tough start

When Oman was awarded the $1,981,000 grading, drainage, and structure contract, rain, snow, and frozen ground killed chances—for a few months—for any good production in removal of over a million cubic yards of excavation.

Even though this included about 400,000 yards of rock excavation, Oman had a difficult time trying to remove the overburden with its scraper fleet. The contractor could not get really rolling until the middle of February because of the wet and frozen ground conditions.

Rock work

Oman brought in four Gardner-Denver Air Tracs powered by four Gardner-Denver 500-cfm compressors to handle the drilling. Using 2⅝-inch-diameter carbide-insert drill bits on 20-foot steel, Oman began removing the rock in 20-foot lifts. Blast holes were sunk on a 6×7-foot drill pattern and primed with Atlas extra 40 per cent dynamite.

The actual explosive was a mixture of ammonium nitrate and diesel fuel, and this required a prime charge. Electric blasting caps with millisecond delays activated the dynamite

Grading, drainage, and structure work was included in the contract. This Lorain truck crane uses a clamshell bucket to excavate rock from a bridge foundation. The Lima, background, loads out broken rock.

Allis-Chalmers Selects Twin Disc Torque Converter for TL-14's Tractomatic Transmission

EIGHTEEN YEARS AGO Allis-Chalmers introduced the first torque converter drive in a crawler tractor. That original unit featured a Twin Disc converter, and the same is true of many present-day Allis-Chalmers construction machines. For the optional Tractomatic Transmission in the new TL-14 Tractoloader, Allis-Chalmers engineers have once again incorporated a Twin Disc Torque Converter.

This transmission provides the key advantage of power shifting in a simpler, more economical unit. A direction control lever on the steering column actuates forward and reverse clutches hydraulically — changes directions without clutching, shifting gears, or stopping the machine.

Since reverse speeds are 30% faster than forward, reversing the machine automatically increases its speed. This eliminates the usual necessity of shifting gears manually to achieve the same effect.

The Tractomatic transmission has four speeds in both forward and reverse. On short haul loading and stockpiling jobs, it is seldom if ever necessary to change speeds once the proper ratio is selected.

A Twin Disc Single-Stage Torque Converter is an integral part of this transmission. Besides increasing torque automatically as needed, the converter permits rapid clutch engagement and absorbs the shock of the shift in its whirling fluid.

A test of the TL-14 Tractoloader at your Allis-Chalmers dealer will demonstrate why so many of America's leading earth-moving equipment manufacturers are standardizing on Twin Disc Torque Converter Drive.

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • Hydraulic Division, Rockford, Illinois

For more facts, use Request Card at page 18 and circle No. 309

◄ Scrapers work a single daytime shift; the DW21, returning from a fill area, passes a lube van that is positioned off the haul road to catch equipment in need of lubrication.

Drilling for the 400,000 yards of rock excavation is done by Gardner-Denver Air Tracs powered by G-D 500-cfm compressors. The 2⅝-inch blast holes were sunk about 20 feet into the rock stratum. ►

charge that set off the ammonium-nitrate mixture.

Blasted rock was excavated by a Lima 1601 shovel equipped with a 4-yard bucket and loaded into four Euclid rear-dumps. The shovel, working a 9-hour single shift, managed to average 2,000 cubic yards of rock excavation. This production was almost doubled when the machine went on two 9-hour shifts.

Initially, Oman used two Cat DW21's, two DW20's, and a double-engine Euclid scraper to handle the earthwork. As soon as the weather and ground conditions improved, Oman brought in more scrapers for the single daytime shift.

Included in the contract was the construction of five bridge structures to carry the new interstate road over and under existing roads and creeks. Also included were three culverts. All but two of the bridge structures were founded directly on rock.

Personnel

R. W. Kirby was the general superintendent, and James C. Dean, the project superintendent for Oman. John W. Cozine is the resident engineer for the Kentucky Department of Highways. THE END

IEMC elects officers

■ Dick Chinn has been elected president of the newly organized Industrial Equipment Manufacturers' Council. He is manager of market research for Massey-Ferguson Industrial Division, Wichita, Kans. Other newly elected officers are vice president John Scowcroft, assistant to the president of Sherman Products Corp., Royal Oak, Mich.; and treasurer Jim Wormley, sales manager in the Industrial Division of Deere & Co., Moline, Ill. The IEMC has been organized to encourage uniform specifications in the light industrial equipment field.

Hyster expands plant

■ Additional manufacturing and office facilities at the Danville, Ill., plant of Hyster Co., Portland, Ore., are under construction. Completion is expected about October. The Danville Plant No. 2 will be enlarged by 115,000 square feet. Plant No. 1 will be converted to a central depot and parts and service headquarters.

Robert J. Hile is the new office manager of the Danville plant.

At Wild Horse Creek

FULLPAKS® pick up loads like this ...in average of 39 seconds!

Fast-loading? You bet... and the load-time is even more impressive when you consider the material was a mixture of tough clay and rocks. Furthermore, the pusher was only a 102-drawbar-hp unit!

High-ratio of horsepower to loaded weight takes C Tournapull quickly up steep grade.

The time study was taken as Baker Construction Co., of Lindsay, Oklahoma, worked 3 LeTourneau-Westinghouse C Tournapulls® with 18-yd Fullpak scrapers at Wild Horse Creek, Okla. The job: Building a 153,000-yd earthfill dam for the U.S. Soil Conservation Service.

Very pleased with the way his "C's" perform, co-owner R. B. Baker says, "I like everything about these machines . . . particularly their high-production and low maintenance."

One of the chief reasons Baker Construction's Tournapulls move big pay-yardage *fast* is their famed LW Fullpak scrapers. Their low, wide bowls let dirt flow in easily, on a nearly horizontal line (scraper floor is angled at only 2°). Result: More of your prime-mover-and-pusher power is used for *cutting* and *pulling*... less power is wasted merely lifting dirt. In addition, Fullpak's vigorous boiling action fills in corners... eliminates voids... makes it easy to move more pay-yards per hour.

Let us tell you about *all* the important LW features that help make C Tournapull the *biggest money-maker in its class*. Available with 226 hp or 270 V-power... 18 or 20-yd heaped capacity. Ask for a demonstration, no obligation.

CP-2151-DCJ-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 310

Nello L. Teer, Jr., ARBA president, is president of the contracting firm of Nello L. Teer Co., Durham, N. C.

American Road Builders discuss problems of highway program

58th annual ARBA meeting hears members of Congress on roads; Contractor Teer re-elected president; Buttenheim heads CIMA

Nearly 1,000 representatives of road-building interests gathered in Cincinnati, Ohio, January 18–21, to participate in the 58th annual convention of the American Road Builders' Association. The ARBA delegates discussed present and future problems of the road-building industry and planned how to cope with them. In this they were benefited by the remarks of three Congressional leaders in the highway field who answered questions from the press in a panel discussion session.

The convention re-elected Nello L. Teer, Jr., to serve a second term as president of ARBA. Teer heads the Nello L. Teer Co. of Durham, N. C. When elected to office last year, Teer was only 45, and was the youngest man ever to hold the association's highest office in its 57-year history.

Emphasis on youth was also followed by the Construction Industry Manufacturers Association, the manufacturers division of ARBA, in electing 44-year-old Donald V. Buttenheim as its president. The new CIMA head is the youngest to be elected to that office. Buttenheim is president of Buttenheim Publishing Corp., New York, N. Y., which publishes CONTRACTORS AND ENGINEERS magazine.

O. H. Henry of General Motors Chevrolet Division presents the key of a 1960 Chevrolet El Camino to William B. Sands as ARBA convention hostess, Mrs. John A. "Billie" Lloyd, Jr., looks on. Sands, winner of ARBA's grand prize for attendance at convention sessions, is with Warren & Van Praag, Inc., consulting engineers of Decatur, Ill. "Billie" Lloyd does not go with the El Camino.

Avoid these problems...

New steels are born at Armco

Too Much Construction Work?

Crews Needed for Other Jobs?

Projects to be Handled Quickly?

Assuring Profit on Unfamiliar Jobs?

Hiring Additional Crews?

Impending Completion Deadlines?

Equipment Tied Up?

Buy Armco Products Installed

By purchasing your Armco products for engineering and construction on an installed basis, you gain the advantage of known cost and quick installation of specialized jobs. These facilities of Armco Construction Service are available to general contractors on a fixed-price subcontract.

For the past 29 years, this service has been used by contractors all over the country. Both equipment and skilled crews are available to handle your jobs quickly and economically. Send coupon for catalog on this service. Armco Drainage & Metal Products, Inc., 5330 Curtis St., Middletown, Ohio.

Armco Drainage & Metal Products, Inc.
5330 Curtis Street, Middletown, Ohio

Send me this FREE Book on Armco Construction Service

Name.....

Firm.....

Street.....

City.....Zone.....

State.....

Right: In Milwaukee, Wisconsin, this Armco Construction Service crew is installing a tunnel of Armco Liner Plates for a storm sewer under railroad tracks.

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

For more facts, use coupon or Request Card at page 18 and circle No. 311

Donald V. Buttenheim, CIMA president, is also president of the Buttenheim Publishing Corp., which publishes CONTRACTORS and ENGINEERS magazine.

Scherer welcomes convention

Rep. Gordon Scherer (R., Ohio), ranking minority member, subcommittee on roads, who represents the Cincinnati area in Congress, greeted the delegates at the first general session in the Netherland Hilton hotel. In speaking of the highway program, Congressman Scherer said that highways should be built where the need for them exists and not just where the votes are; also that they should be paid for as they are built, without passing their cost along to future generations. He recommended, too, that users pay for highways in proportion to the use they make of them, "even though it may mean broadening the tax base to include all those who will benefit from this modern system of highways."

Highway information program

In his annual report, president Nello L. Teer, Jr., told how last July the ARBA board of directors authorized the appointment of a public-information advisory committee. This committee, composed of public-relations men working in the highway field, was asked to advise ARBA how best to foster public understanding of the need for and benefits of a long-range, soundly financed federal-aid highway program. The committee came up with two basic recommendations:

1. The organization of a comprehensive, coordinated, consistent and continuing national highway information program, to be implemented at national and local levels.

2. The organization of an autonomous Better Highways Information Committee to put the proposed program into action and supervise its execution; its members to include leaders not only in the highway field but also in government, communications, education, service organizations, and other key elements of national and community life.

This committee is being organized and has adopted the slogan: "Better Highways NOW—Save Lives, Save Time, Save Money."

Bertram D. Tallamy, Federal Highway Administrator, was scheduled to address the first general session but was unable to attend. His speech was read by his special assistant, Robert M. Monahan. Tallamy remarked that "despite the efforts of the highway departments, the Bureau of Public Roads, and the many organizations involved in better-road movements, the general public is not well acquainted with what we are doing and why. We must get the story across to the public if we are to win and hold the necessary public understanding and support. Basically, this is a job for the highway departments, but it is also one in which the pooling of all our efforts will be required."

Tallamy mentioned that the Bureau of Public Roads would cooperate in the efforts of the Better Highways Information Committee, "as we do in other similar educational projects, in those areas and to the extent appropriate for a government agency. . . . I understand that this program is aimed at grass-roots understanding of highway problems, and one which does not involve lobbying, high pressure, or a campaign for any particular kind of highway financing."

In his paper "Modern Equipment and Construction Economy," H. A. Radzikowski, chief, division of development, Bureau of Public Roads, disclosed that the total number of equipment units, including motor vehicles, available for highway construction and maintenance is about 750,000, including some 350,000 units for construction purposes. He cited the high mechanization of modern highway construction in this country by comparison with other countries. "In the United States," said Radzikowski, "we have, for example, 81 tractor-dozers per 1,000 construction

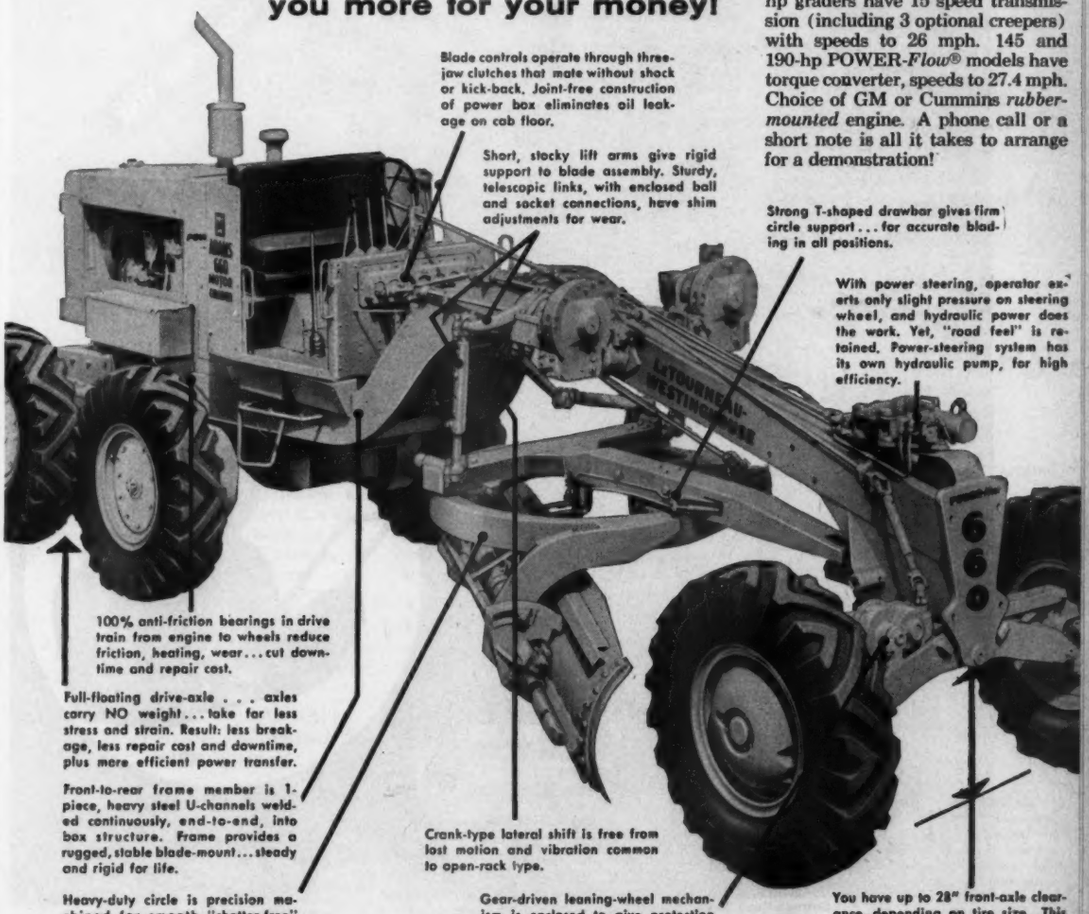
COMPARE

LW Adams* advantages with any other grader

...you'll be convinced they give you more for your money!

Best way to judge a grader is to compare it . . . against any machine in its class. Do this with LeTourneau-Westinghouse graders; you'll find they give you *more money-saving, more work-boosting features than any other grader on the market.* Others may offer *some* of these advantages, but you get *all* of them in high-speed L W graders.

Check the features illustrated here, then take the next step . . . ask us to show you an L W grader in the size you need. The 80, 115, 123, and 160 hp graders have 15 speed transmission (including 3 optional creepers) with speeds to 26 mph. 145 and 190-hp POWER-*Flow*® models have torque converter, speeds to 27.4 mph. Choice of GM or Cummins *rubber-mounted* engine. A phone call or a short note is all it takes to arrange for a demonstration!


Blade controls operate through three-jaw clutches that mate without shock or kick-back. Joint-free construction of power box eliminates oil leakage on cab floor.
Short, stocky lift arms give rigid support to blade assembly. Sturdy, telescopic links, with enclosed ball and socket connections, have shim adjustments for wear.
Strong T-shaped drawbar gives firm circle support . . . for accurate blading in all positions.
With power steering, operator exerts only slight pressure on steering wheel, and hydraulic power does the work. Yet, "road feel" is retained. Power-steering system has its own hydraulic pump, for high efficiency.
100% anti-friction bearings in drive train from engine to wheels reduce friction, heating, wear . . . cut down-time and repair cost.
Full-floating drive-axle . . . axles carry NO weight . . . take far less stress and strain. Result: less breakage, less repair cost and downtime, plus more efficient power transfer.
Front-to-rear frame member is 1-piece, heavy steel U-channels welded continuously, end-to-end, into box structure. Frame provides a rugged, stable blade-mount . . . steady and rigid for life.
Heavy-duty circle is precision machined for smooth "chatter-free" operation. The *big* 63"-diameter circle assures accurate control of cut. Replaceable circle teeth are protected from abrasive materials.
Crank-type lateral shift is free from lost motion and vibration common to open-rack type.
Gear-driven leaning-wheel mechanism is enclosed to give protection against dirt. Wheels hold set position . . . require no safety lock-pin for high-travel-speeds, or when using front-end attachments.
You have up to 28" front-axle clearance, depending on tire size. This prevents axle from bulldozing high windrows, lets grader come up out of deep ditch-cuts without front-axle dragging the shoulders.
LeTOURNEAU-WESTINGHOUSE
660

*Trademark G-2106-G-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

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Maj. Gen. Louis W. Prentiss (ret.), executive vice president, ARBA, reports on the nation's highway program. Robert O. Swain, right, the executive director of the International Road Federation, speaks before the Construction Industry Manufacturers Association meeting.

(Continued from preceding page)

workers as compared with 5.8 units in Russia and only 0.9 of a unit in Poland."

Radzikowski traced the development of modern highway equipment in grading, base-course construction, and paving operations. "We have benefited by a continuous improvement in earthmoving machinery," he noted, "particularly as to speed, capacity, and maneuverability. Added to the improved equipment was the development of contractor know-how. The fact that unit costs of common excavation have remained about the same over a period of 30 years attests to the benefit the taxpayer receives from this combination."

The BPR engineer mentioned seismic equipment and soil resistivity instruments as aids to contractors, enabling them to know more about the material they will encounter below the surface. Such information may permit ripping and scraper-loading material that in the past might have had to be blasted and loaded with power shovels. In discussing areas where improvements might be made, Radzikowski suggested that specifications have not caught up with improved plants and equipment for mixing both bituminous concrete and portland-cement concrete. He declared that some specifications for bituminous concrete require mixing times that are 50 to 100 per cent longer than those needed by a modern plant in good condition to produce a uniform and thoroughly coated mix. As for the materials mixed in a 34-ft paver for a cement-concrete pavement, Radzikowski noted that specifications vary in mixing-time requirements from 50 to 120 seconds, in spite of the fact that research has shown that mixing beyond 60 seconds is not warranted by any improvement in quality.

Cost-benefit highway ratio

In his annual report, Maj. Gen. Louis W. Prentiss (ret.), executive vice president, ARBA, said that in his opinion the measurable benefits of the interstate highway program amount to roughly three times the cost of the program. This 1 to 3 cost-benefit ratio, according to Prentiss, makes the interstate program one of the most attractive public-works investments ever undertaken by the federal government.

Maj. Gen. Prentiss mentioned that financing was the major problem confronting the highway program, but that a long-range solution to that dilemma cannot be reached earlier

At the Materials and Services exhibit, held in conjunction with the ARBA convention, Peggy Ann Alderman lectures on Columbia calcium chloride at the Columbia-Southern Chemical booth.

GORMAN-RUPP
DIAPHRAGM PUMP

Gorman-Rupp Model 3D-8BR6 pumping in 60-ft. deep excavation for California bank building.

guaranteed to outperform them all!

When this pump was purchased by the contractor, he bought it with the guarantee that it would "pump more dirty water, run more smoothly, outlast and outperform any similarly sized and comparably powered diaphragm pump on the market." In fact, the distributor was authorized to put the Gorman-Rupp Diaphragm Pump on the toughest pumping jobs—in competition with other make pumps of the same size and type. And—if the Gorman-Rupp did not prove to be the best all-around pump, we would accept its return and pay the user any installation expense. This pump and its guarantee are available to you. If there is any greater satisfaction than in being able to buy with that kind of assurance, it's in being able to build and sell with that kind of confidence.

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than 1961. At that time the Bureau of Public Roads will bring in its comprehensive report on highway costs attributable to the various classes of highway users, and the highway benefits which accrue to the various classes of users and nonusers.

"This, together with the third in the series of periodic estimates of the cost of the Interstate System," said Prentiss, "will give Congress the best information possible on which to base a revision of the revenue laws supporting the Highway Trust Fund. This will give Congress a factual basis to decide as to what should and must be done.

"Two very important studies of the highway program are going forward at the present time," Prentiss told the delegates. "A White House study group is looking at the whole concept of the interstate program, with particular emphasis on the urban aspects, to determine whether any change in scope or emphasis of the program is needed. A special subcommittee of the House Committee on Public Works is also studying the highway program, to determine whether money is being wasted through extravagance or poor administration. A subcommittee of the House Ways and Means Committee is waiting for the Public Works group to come up with some findings before it begins an investigation of its own. ... We can look forward with assurance that 1961 will be an active and important highway legislative year. As one member of Congress has aptly put it, the legislative hassle of 1959 will look like a pink tea party when compared with the battle royal that is shaping up for 1961."

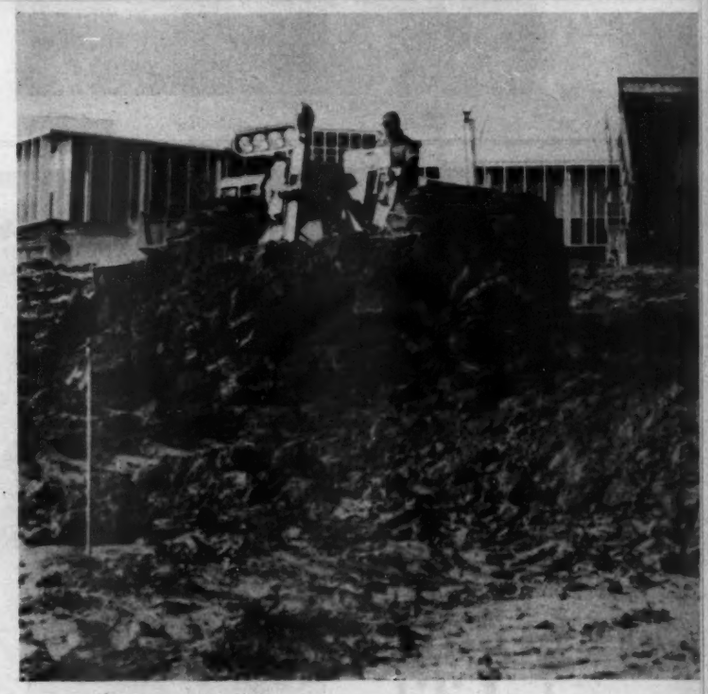
Other sessions

In addition to the general sessions and meetings of the various divisions of ARBA, two technical sessions were held. One had for its theme the topic "What education has to offer for road building," and was sponsored by ARBA's Educational Division, which is observing its 25th anniversary in the association. The other technical

(Continued on next page)

Henry A. Radzikowski, chief, division of development, Bureau of Public Roads, speaks to a session on "Modern Equipment and Construction Economy."

In a panel discussion, "Congress Talks to the Press," Congress was represented by Rep. Gordon Scherer of Ohio, Rep. George H. Fallon of Maryland, and Sen. Dennis Chavez of New Mexico.



Miller Excavating's Tournatractor levels truck-dumped fill at Indian Hills Village . . . an Omaha office bldg. development. This torque-converter tractor spread an average of 300 truck-loads of chunky clay per 9-hr shift. Says Foreman Leroy Bartlett, *"Tournatractor completes dozing jobs twice as fast as a crawler."*

Omaha firm proves rubber-tired tractors

do more work . . . save time and money

When handling a number of earthmoving jobs in-and-around a big city, or scattered over a wide area, *mobility* rates high as an equipment requirement. That's why Miller Excavating Company . . . a firm handling a wide variety of earthmoving projects around Omaha, Nebraska . . . today own two LeTourneau-Westinghouse 17.2-mph Tournatractors®.

Miller's go-anywhere LW rubber-tired tractors — which replaced 2 slow-moving crawlers — drive job-to-job over city streets and highways. The firm has no extra costs for trucks, trailers, and additional men when moving Tournatractors to new locations.

And on the job, like the two pictured, Miller's speedy LW tractors complete most assignments in less time than is normally required by a crawler tractor of comparable power.

Says Superintendent William Welch, "Tournatractor is a very maneuverable tool that gets around fast. It's hard to beat."

Costs less to buy . . . less to operate

Have you considered retiring some of your older slow-moving crawlers, and replacing them with speedy, go-anywhere, 218-hp Tournatractors? Compared with crawlers of comparable size and horsepower, this more versatile rubber-tired tractor costs less to buy, less to operate. We'll be glad to demonstrate.

Tournatractor push-loads one of Miller Excavating's 3 LeTourneau-Westinghouse C Tournapulls® on a project at the new Western Electric plant in Millard, Nebraska. Powerful tractor push-loaded 18-yd Fullpak® scrapers in an average of 45 sec. Instant-shift Tournatractor also gives these production haulers a high-speed boost out of the cut . . . reducing cycle time.

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LW

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(Continued from preceding page)

At the Texaco Asphalt booth, Prof. Ladis H. Csanyi (bow tie) of Iowa State University has the ear of Jim Smith, Texaco representative.

session consisted of a symposium on soil stabilization.

Another well attended session was a panel discussion "Congress Talks to the Press." Representing Congress on the panel were Sen. Dennis Chavez (D., N. Mex.), chairman, Senate committee on public works; Rep. George H. Fallon (D., Md.), ranking majority member, House public works committee, and chairman, subcommittee on roads; and Rep. Gordon Scherer.

Asking the questions were the following members of the trade press: Donald V. Buttenheim, president, Buttenheim Publishing Corp., which publishes CONTRACTORS AND ENGINEERS magazine; James Ballard, *Western Construction*; Harold J. McKeever, *Roads and Streets*; George Stewart, *Constructioneer*; and Robert Boger, *Engineering News-Record*.

Materials and Services Exhibit

In conjunction with the convention, 45 exhibitors had display booths at the Materials and Services Exhibit. This sixth annual exhibit displayed materials necessary to the construction of modern highways, together with related technical services.

ARBA's annual grand prize for the lucky one of its registrants went to William B. Sands of the consulting engineers, Warren & Van Praag, Inc., Decatur, Ill. The prize, a new 1960 Chevrolet El Camino, was presented by O. H. Henry of the Chevrolet Motor Division, General Motors Corp.

Social functions for the ladies attending the convention were handled by Mrs. John A. "Billie" Lloyd, Jr., convention hostess.

ARBA elects

In addition to re-electing Nello L. Teer, Jr., as president, the ARBA convention chose two new vice presidents and seven new directors. The vice presidents are: Armand Keeley, Prismo Safety Corp., Huntington, Pa.; and George M. Foster, Indiana State Highway Dept., Indianapolis. The directors are: E. B. Cape, E. B. Cape Co., Houston, Texas; Robert S. Holmes, U. S. Steel Corp., Pittsburgh, Pa.; W. K. Cox, Caterpillar Tractor Co., Peoria, Ill.; John C. Mackie, Michigan State Highway Dept., Lansing; H. L. Aitken, District of Columbia, Washington; Mason Butcher, Montgomery County department of public works, Rockville Md.; and George B. Hills, Reynolds, Smith & Hills, Jacksonville, Fla.

ARBA's Contractors Division elected as its president R. W. Hyde, president of the Hyde Construction Co., Jackson, Miss. Division members also named two vice presidents: James E. Lambert, Lambert Construction Co., White River Junction, Vt. (re-elected); and Ralph Heffner, Heffner Construction Co., Celina, Ohio.

CIMA meets

The annual meeting of the Construction Industry Manufacturers Association, the manufacturers division of ARBA, also met during the convention. CIMA has 203 members. The group was addressed by Robert O. Swain, executive director of the International Road Federation, who revealed that an 8.3 per cent increase in the free world's spending on highways during 1959 pushed total road expenditures to a new record. Swain said that total expenditures for highway construction, maintenance, and administration in 1959 is estimated at $18.6 billion, as compared to $17.13 billion in 1958. The increase marked the twelfth consecutive year that global highway activity has expanded.

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DUMP BODIES

WORLD'S LEADING LINE OF QUALITY DUMP AND TRAILER BODIES

bigger loads

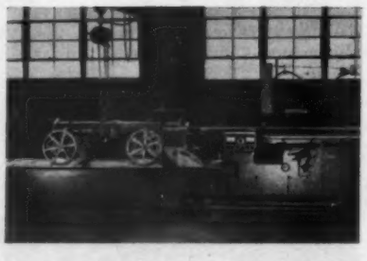
greater stability

faster dumps

New Anthony Teleramic Twin Out-Mount Telescopic Hoists

New Anthony Teleramic Twin Out-Mount Telescopic Hoists – lighter, stronger, faster lift for more payload. Eliminates deadweight of cams, links, arms, etc. Mounted lower, wider for greater stability. No well necessary because of twin out-mount. Simplified design takes less power, less maintenance. Ring-trussed telescopic cylinders eliminate buckle, bulge and bends . . . strongest in their class! Designed for use with Anthony heavy-duty dump bodies – balanced strength and ruggedness. Applies hoist power toward front end of load for maximum mechanical advantage.

Illustrated is the heavy-duty dump body built with extra margin of quality, strength and ruggedness you expect – and get – from Anthony. Have your Anthony distributor recommend the hoist and body you need. If you don't know his name, write us. Anthony Company, Streator, Ill.



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Swain forecast that 1960 expenditures around the world would increase 7½ per cent over 1959, reaching a total of $20 billion. U. S. spending is expected to rise 5 per cent to $11.5 billion, and foreign spending 11 per cent to $8.5 billion. The IRF tabulations and predictions are based on its survey of 144 countries and territories.

In addition to electing Donald V. Buttenheim to its presidency, CIMA chose two vice presidents and a treasurer for one-year terms. Arthur J. Lichtinger, The Wellman Engineering Co., was picked for first vice president, and W. J. Cox, Caterpillar Tractor Co., for second vice president. W. A. Nugent, Thor Power Tool Co., is treasurer.

New directors elected are Merle R. Yontz, LeTourneau - Westinghouse Co., to a one-year term, and seven others to three-year terms. The latter are: John S. Wadsworth, Littleford Bros., Inc.; William D. Lease, Athey Products Corp.; Warren A. Holden, Construction Machinery Co.; Robert E. Hunter, Detroit Diesel Engine Division, General Motors Corp.; David A. Milligan, J. I. Case Co.; John A. Penote, The Cleveland Trencher Co.; and C. B. Smythe, The Thew Shovel Co. THE END

Unit Crane acquires line of Coles cranes

■ Unit Crane & Shovel Corp., Milwaukee, and Steel & Co. Ltd., Sunderland, England, have completed arrangements giving Unit distribution and manufacturing rights under license for the line of Coles all-electric, gas, or diesel-driven mobile cranes, in the United States, Canada, and Mexico.

The crane was formerly manufactured by Coles Cranes Inc., Joliet, Ill. All manufacturing will now be transferred to Unit's home plant. In the past, Coles' American manufacturing activities have been restricted to the smaller sizes, but with Unit's facilities the complete range of sizes from 5 to 50-ton capacity will be available.

Under the reciprocal licensing arrangement with Steel & Co. and its various subsidiaries, Unit products will be manufactured and distributed by Steel in all world markets except Australia, South Africa, and the Benelux countries, where Unit already has licensing agreements.

Waukesha names manager

■ Frederick J. Gunther has been named product manager of the Marine Engine and Public Works divisions of Waukesha Motor Co., Waukesha, Wis.

American Air Filter news

■ James F. Fish has been promoted to manager of the commercial portable products department of American Air Filter Co., Inc., Louisville, Ky. He has headquarters in the home office.

TRAVELING ACROSS THE CANYON to the spillway location of Vega Dam near Grand Junction, Colo., a Maxon 4-yard Dumpcrete, mounted on a Ford F8 truck, brings concrete to a Gar-Bro 1-yard bucket handled by a Koehring 605 crane with 90-foot boom. The long boom enables the crane to reach a good length of the spillway.

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CHECK EUCLID C-6 WORK-ABILITY

You'll find this new C-6 has the all-around tractor versatility needed for heavy construction, mine and quarry work. With five years of rugged field and proving ground test, this new crawler sets higher standards of performance on the toughest jobs for tractors in the 200 h.p. class.

Here are just a few advantages you get in the C-6 . . . a dependable GM 6-71 engine delivering 211 net h.p. to the power train . . . a proven Torqmatic Drive that provides full-power shift and cuts cycle time . . . fast-as-a-fox maneuverability . . . almost unbelieveable ease of handling . . . accessibility for servicing that pays off in more productive time on the job. It responds like nothing you've ever touched!

Have your Euclid dealer give you all the facts on the C-6 . . . he'll show you why this new "Euc" belongs in your spread . . . why it's your best equipment investment.

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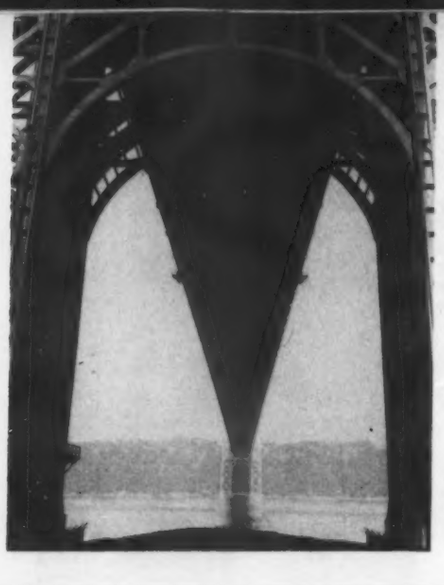


Crews on the lower-deck project of the George Washington Bridge between New York and New Jersey work from maintenance bridges, one of which can be seen just ahead of the New York tower. Four bridges are being used, two in the main span, one in each side span. They ride on track beams suspended from the upper-deck stringers.

New methods used in double-decking George Washington Bridge

One of the most unusual construction projects ever attempted is now being carried out by Bethlehem Steel Co., Bethlehem, Pa.,—the erection of steel for a lower deck of the George Washington Bridge over the Hudson River.

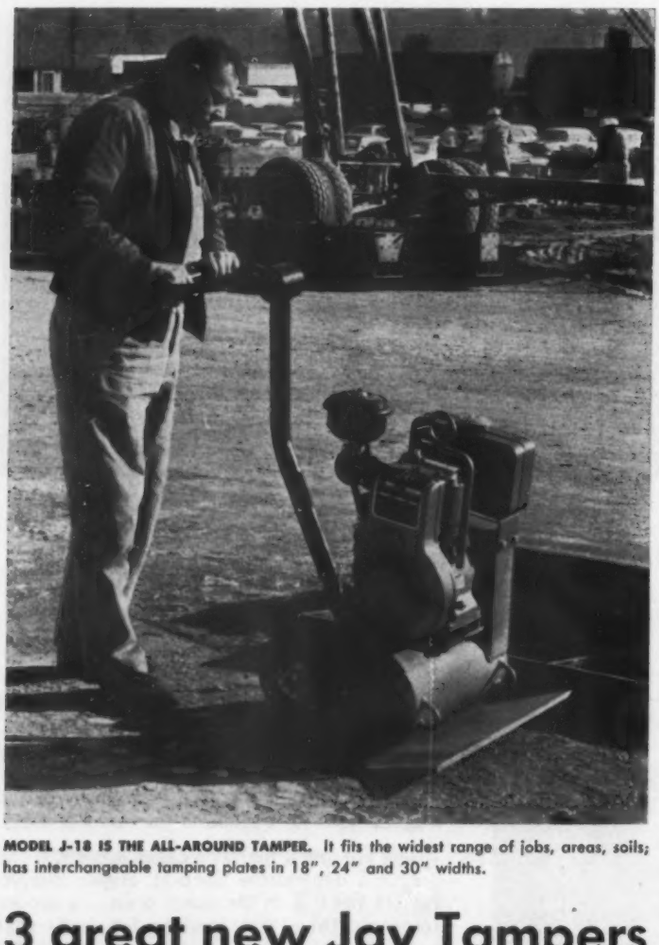
The 4,760-foot-long bridge connecting New York City and New Jersey was opened to traffic in 1931, and its design provided for the addition of a lower deck at some future date. But no detailed scheme or technique for adding the new 6-lane roadway was ever made beyond providing gusset plates on the wind chord of the existing structure. This chord was also designed as the top chord of the future stiffening truss to be added with the lower deck. The present structure depends for its rigidity solely on tremendous mass and the stiffness of the four 36-inch-diameter parallel wire cables, the largest ever spun.

Existing structure

The deck of the bridge consists of 10-foot-deep × 118-foot-long floor beams at 60-foot centers, supporting ten 5-foot-8-inch-deep stringers, framed in at one end and with expansion at the other end, and spaced 12 to 14 feet apart. The floor beams are supported at each end by the double hanger or suspender connection to the cables. The bridge floor—a concrete slab or concrete-filled steel grid—forms a closed overhead ceiling for any operations under the heavily traveled roadway. The specifications for the new lower level call for no interruption to traffic beyond the occasional use of one of the outside lanes for transportation of men and delivery of minor supplies, and this only at certain restricted hours and intervals. For all practical purposes, all erection operations are being carried on from below.

The new lower deck is supported entirely through the connection of the new stiffening-truss members, verticals and diagonals, to the existing gusset plates at the present floor-beam panel points located 60 feet apart on the existing wind chord. These gussets, mostly of silicon steel, were blank, and the first operation on the existing structure was to locate the new connections on them and to drill the connection holes. At each panel point there are three members to be connected, two diagonals and a vertical hanger. The stiffening trusses are spaced 106 feet, center to center.

The new lower-level deck will be supported by 7-foot-deep floor beams on 30-foot centers that support 24-inch wide-flange 76-pound stringers



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MODEL J-13 IS THE SMALL AREA TAMPER. Ideal for soil under footings, in narrow ditches and for bituminous concrete compaction, using special water plate available as J-13 accessory. Has interchangeable soil tamping plates in 13", 18" and 24" widths.

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Air Force Academy construction project.

3 great new Jay Tampers speed compaction 6 ways

Jay now gives you unequalled performance on all types of compaction where big equipment is uneconomic:

1. TAMP HARDER:
Tamping force increased up to 50%.

2. TAMP FASTER:
Travel speed increased up to 100%.

3. TAMP BETTER IN HEAVY SOILS
because of improved plate contour.

4. HANDLE EASIER:
New tubular-loop handle provides better grip, turns machine in shorter radius, dissipates vibration more effectively through new rubber shock-mount and steel cable connection.

5. MAINTAIN EASIER:
Mechanical improvements include larger oil-bath air cleaner and new air cleaner mounting of solid cast aluminum, bolted rather than clamped.

6. TRANSPORT EASIER:
New Jay Trailer can be loaded, unloaded by one man; carries any one of the 3 tampers.

"CUTS COSTS FROM $2.68 TO 12¢"
These improvements keep Jay years ahead of other tamping machines or methods, add to its already surprising ability to cut costs on all kinds of compaction jobs. One user tested a Jay vs. a 5-man pneumatic tamper crew and reports: "Compaction costs cut from $2.68 to 12¢ per cubic yard." Another reports that Jay cut his compaction costs 89% on one phase of the U. S. Air Force Academy construction project.

Jay is the original one-man, self-contained, self-propelled vibratory compactor . . . the *only* one offering a full range of 3 models and interchangeable tamping plates to fit all jobs. All models are powered with 4-cycle Wisconsin Model BKN engine of 6.8 H. P. at 3600 RPM, or equivalent.

Send today for new Catalog J-0 giving full details and specifications, and for name of your nearest Jay dealer. Jay Division, J. Leukart Machine Co., Inc., 2226 South Third Street, Columbus 7, Ohio.

JAY tampers

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spaced on 5-foot-7½-inch centers. Two 36-foot roadways will be provided, the deck being of concrete-filled 4¼-inch I-beam grid with a 2-inch wearing surface.

Maintenance bridges

The new deck provides for four new maintenance bridges, two in the main span and one in each side span. These will run on two tram rail beams supported on the bottom flange of the new floor beams. Bethlehem Steel fabricated these maintenance bridges, altering the design slightly, and delivered them to the project before starting work. They were used to accurately locate and align the connections on the gusset plates. These bridges are supported on four 24-inch wide-flange track beams. The beams are rigidly bolted to the top chord of the maintenance bridges. The beams are supported by a series of hangers spaced about 14 feet apart on 4 lines of stringers in the present deck.

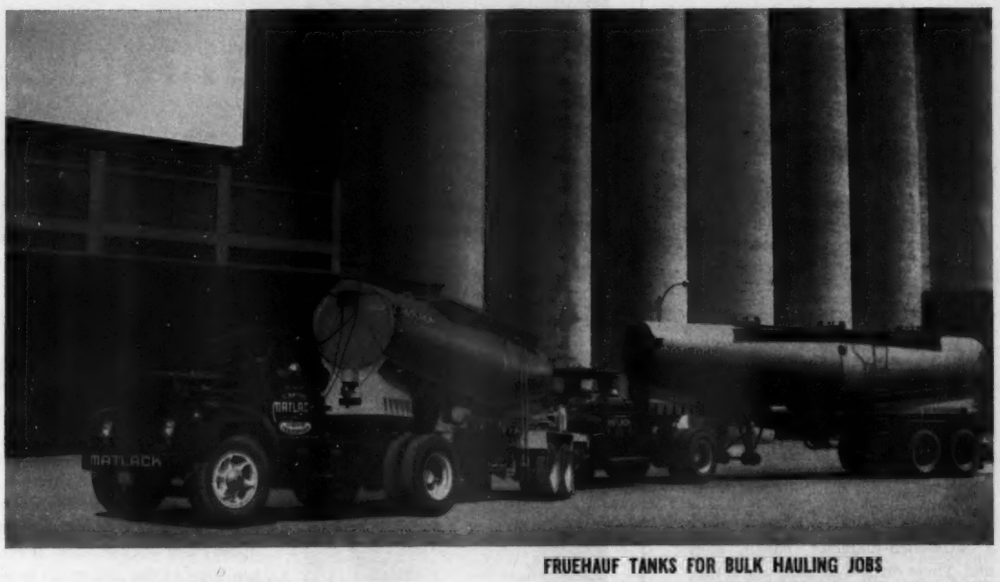
These hangers have rollers at their lower ends, on which the top flange of the track beams is supported. This allows them to roll so that the maintenance bridge may be pulled ahead by means of small sets of falls operated by Beebe air hoists. The maintenance bridges serve as working platforms for all preliminary operations under the deck. Extension platforms at each end give access to the existing gussets for drilling the new connections. Extended platforms on each side, at the track beams, allow crews to erect the hangers ahead of the bridge. The hangers have been designed to be as light as possible, since they must be assembled and placed by hand. Each hanger consists of a pair of channels, with a short horizontal section, top and bottom, of welded construction. Each assembled hanger, including the roller, weighs about 530 pounds.

Operations started on each side of the river with the construction of a landing dock and the erection of derricks for unloading equipment. On the New York side, a relatively small installation has been constructed. It consists of a light dock for mooring barges, and a 75-ton-capacity stiffleg derrick for assembling sections of the new stiffening trusses and roadway. On the New Jersey side, the installation is more elaborate. Here, there are two 35-ton-capacity derricks with 115-foot booms and 20-foot jibs. These derricks are supported on steel-pile footings. A series of mooring piles is used to tie up the barges while materials and equipment are transferred. The installations are just south of the bridge. On each side of the river there is a wide-gage track through the assembly yard and underneath the bridge. The track is just in back of and on the shore side of the massive towers. Assemblies are made in the yard on special trucks and are run beneath the bridge on this track.

In hoisting the maintenance bridges up underneath the present deck, light

(*Continued on next page*)

A pair of 24-inch track beams stretch under the New Jersey side span. They are supported by steel channel hangers suspended from the existing upper-deck floor stringers. Hangers have rollers so that the track sections can be pulled from the tower to the anchorage as the maintenance bridge moves forward.



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Steel, aluminum, and stainless steel Fruehauf tanks are designed and built to out-last and out-earn all others. The new Fruehauf Airslide* Pressure Tank, for instance, is capable of unloading up to 115 barrels of aerated cement, barites, or powdered chemicals in only 30 minutes, pumping them as high as 80 feet. Such time savings are *profitable.*

Automatically welded Fruehaufs are the longest-lasting, safest, most leak-free vessels in the business. Dollar for dollar, their specifications exceed all others for quality and value. And there is a Fruehauf hoist, cable, or hopper type dump, or a Fruehauf platform or carryall, for profitable duty on every type of construction and roadbuilding job.

For Forty-Six Years—
World's Largest Builder
of Truck-Trailers!

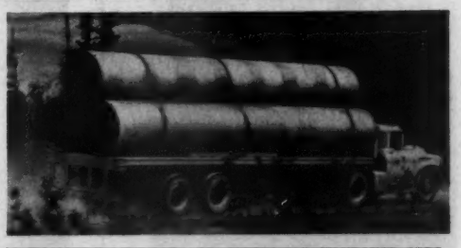
FRUEHAUF TRAILERS

FRUEHAUF TANKS FOR BULK HAULING JOBS

E. Brooke Matlack, Inc., of Philadelphia, recently purchased 150 of these Fruehauf Airslide* Pressure Tanks to haul bulk cement on construction jobs in Pennsylvania.

*"Airslide"—Trademark, Fuller Company

FRUEHAUF DUMPS FOR GRAVEL HAULING JOBS



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Two stiffleg derricks, each with a 35-ton capacity and 115-foot boom with 20-foot jib, handle steel shipments. They will also handle placement of the partially fabricated lower-deck steel panels on barges used during erection of the center-span section of the lower deck.

move the track hangers by hand. To move a maintenance bridge to the next working position, a set of four hangers was erected and the bridge was pulled forward into them. As it moved, a set of new track beams was erected at the tower, for a side span, and connected to the track beams previously erected. All these were then pulled along with the maintenance bridge as it moved toward the anchorage. The beams being used for this purpose are 24-inch wide-flange 76-pound sections that will form the permanent stringers for the lower deck.

When the maintenance bridges finally reached the anchorage in each side span, a complete set of track beams had been erected for the full length of the side spans, from the tower to the anchorage. These track beams were then wedged up off the trolley wheels and fixed in place to act as a fixed track for the erection trolleys. At this time, the maintenance bridges in the side spans were lowered to the ground and temporarily stored. They will be raised again after the permanent floor beams of the lower deck are positioned.

The procedure in the main span was

(Continued from preceding page)

sets of falls were first hung in place by hand. Crews worked out from the towers, in which elevators are used for getting men up to the deck level. Small lifting beams were bolted in place; heavier tackle was then hoisted, bolted, and pinned off; and finally the heavier equipment was raised. The engines for this work are located on the ground near the base of the towers.

The new holes to be drilled were located by clamping special templates to the present gusset plates, aligning them accurately by careful measurements, and marking and drilling a key set of holes. These were then used to bolt on a full-size template through which the remaining holes were drilled. Drilling was done with Ingersoll-Rand Multivane drills using 1 1/16-inch-diameter cobalt steel bits. These drills were held to the face of the gusset plates by Bux electromagnetic drill stands. The drilling equipment also included three core reamers that were used to increase the existing ¾-inch-diameter holes on the floor-beam webs to 1 1/16-inch diameter.

Moving bridges

The two pairs of 24-inch track beams that support the maintenance bridges extend well beyond either side to form a working platform from which men can erect, adjust, and re-

An Ingersoll-Rand Multivane drill with 1 1/16-inch drill bit is held in position by a Bux electromagnetic drill stand while holes are made in the gusset plate on the wind chord of the bridge. A template has been bolted into position for the operation. The wind chord was designed as the top chord of the stiffening truss to be added with the lower deck.

"We carry up to 2,500 lb. mo ayl
FORD Tandems and still outru the

SAYS HARRY R. KUNZ
PRESIDENT, KUNZ PAVING CO.
SAN MATEO, CALIFORNIA

Mr. Harry R. Kunz, a Registered Public Accountant in the construction field for 20 years, started the Kunz Paving Company in 1954. He and his two sons, Harry Jr. and Gerald, expect to do $500,000 worth of work with their fleet of 16 Ford Trucks this year. Here is what he has to say about these trucks.

"Our experience with Fords has proved them to be the best all-around truck we can buy! They haul more payload, cut down considerably on trip time and cost less to operate and maintain.

"The lighter chassis weight of the Ford Tandems lets us carry as much as 2,500 pounds more than competitive makes. This extra payload means that we can haul as much in ten trips as the others do in eleven. Our Fords will beat them on a trip-for-trip basis, too!

"On a 30-mile haul, our '59 T-800 equipped with Transmatic Drive will lap other trucks on the same job every fourth trip. This not only reduces our hauling costs but it makes our Ford's more attractive as rental units for other contractors. One of our associates had two of his trucks and two of our Fords working on the same job. He actually paid for the rental of our trucks by the extra trips they made.

"Our cost records, set up on an hourly basis to make it easier to prepare bids, show that the longer life built into Ford Trucks makes them less costly to operate. We have one '56 Ford T-750 with over 100,000 miles on it that we use as a base for our tandem hauling costs. In spite of its high mileage – gas, oil, tires, maintenance and repairs amount to only $2.08 per hour. Facts and figures like these keep us sold on Ford Trucks for our business."

Air for drilling operations on the bridge is supplied from this compressor bank. Three Chicago Pneumatic 365-cfm compressors send air through a 4-inch line that runs up to the bridge deck and down to the maintenance bridge.

similar, but no track beams were left in place on the existing structure. The maintenance bridges were assembled on barges floated out along the tower, and were hoisted into place by sets of falls hung from beams beneath the present deck. As the two maintenance bridges, using their own track beams, moved from the towers toward the center of the bridge, a set of hangers was removed from the rear or shore side and another set erected ahead. When the two bridges met at the center of the span, they were lowered onto barges and sent back to the yards for storage until crews are ready to erect them permanently below the new lower deck.

Steel erection

Erection will start in each side span and proceed simultaneously until each side span is completed. The erection on each side of the river will be handled by four erection trolleys, supported by and running on the four lines of 24-inch track beams previously erected and left in place. Each erection trolley will be supported by four trolley trucks, each having four pairs of 8-inch-diameter wheels running on the bottom flange of the now fixed track beams. In the main span, four lines, each of five 30-foot lengths of track beams, will be used to support the trolley trucks. These will be taken from the side span simply by pulling them through the tower after the side-span erection is finished. They will be moved ahead in the hangers each time the erection trolley is moved to a new working position.

The assemblies for the side spans are being made in the yards on each side of the river by the stiffleg derricks that first unloaded all material from barges. The first section to be erected was at the Manhattan anchorage. This assembly was lifted from the yard track adjacent to the tower, hoisted to just below its final elevation, and then pinned off to the trolleys with eight heavy wire-rope pennants. The trolleys were then hauled back toward the anchorage, where the assembly was correctly located and then hoisted into final position. This was done by entering the web members between the gussets and pinning them off. The trolleys were then free to be hauled back to the tower to pick another assembly.

In the main span, the procedure is different only in some details. Here, all assemblies will be made in the New Jersey yard, each on a single barge tied up at the dock. The two derricks at this location will unload material independently from two separate barges, and at the same time erect an assembly on two separate barges. One derrick will assemble sections for the New York side, the other for the New Jersey side of the main span.

Personnel

C. E. Adams is the field superintendent for Bethlehem Steel Co. This field work is being performed under the jurisdiction of George P. Adair, manager of the New York Erection Department. J. A. Sterner is project manager. Henry A. Druding is the resident engineer for the Port of New York Authority, a bi-state agency operating the George Washington Bridge. THE END

The National Safety Council states that the 1959 traffic toll was 38,000 fatalities.

nor ayload on our

tru ther trucks on the same job!"

Again in '60... **FORD PICKUPS beat all leading makes in Gasoline Economy!**

Ford Six delivers 13.1% better gas mileage in second running of Economy Showdown U.S.A.* Standard 1960 ½-ton pickups of the five leading makes were purchased from dealers just as you would and run both empty and loaded, over flat terrain and hills, at low and high speeds, under city traffic and retail delivery conditions.

Certified results show the Ford Six won *every* test—with a combined Ford advantage for all tests of 13.1% more mpg than the average of the other makes tested. In fact the Ford Six beat one competitive pickup by a whopping 27%.

The 1960 Fords not only deliver the best gas mileage of the leading makes—but they do it without sacrificing any of the performance characteristics for which Ford is famous. And, this year, if you buy a Ford instead of a competitive truck, you can be sure to save!

Check the certified records for yourself in your Ford Dealer's "Certified Economy Reports" . . . see and drive the new Ford Trucks . . . check the price tags . . . *and you'll save for sure!*

*Over-all economy test conducted by America's leading independent research organization (name available on request)

CK COST LESS

LESS TO OWN . . . LESS TO RUN . . .
BUILT TO LAST LONGER, TOO!

For more facts, use Request Card at page 18 and circle No. 319

Roof shells go up fast

Hyperbolic paraboloid shells and columns are constructed for 97 cents per square foot

One of the hyperbolic paraboloid shells that form the roof of a one-story store in Bloomington, Minn., stands ready to receive concrete. Eight of the shells were constructed in a week by George Madsen Construction Co., Minneapolis. The 44 shells composing the roof, and the supporting columns, were finished in 8 weeks.

Because hyperbolic paraboloid construction is comparatively new in this country, most contractors don't want to take a chance on it. The roof shapes are weird. The forming is tricky.

This type of building was new to George Madsen Construction Co., Minneapolis, but it decided to risk a bid. The firm got the contract and discovered that construction difficulties of hyperbolic paraboloids had been overemphasized.

In fact, the 44 shells that made up the roof were built at a surprising speed. Generally, the contractor put up eight of the shells (covering 18,000 square feet) in a week. In less than 8 weeks, the roof and columns of the building were completed.

Low cost

The owner of the 511×195-foot building is pleased with the results. He has bought a unique building for a very reasonable price. The cost of the project was $607,600, or $6.07 per square foot. This included the cost of air conditioning, mechanical and electrical work, and the asphalt parking areas.

The cost of building the roof was also unusually low. The contractor bid the concrete shell roof and columns for 97 cents per square foot.

Located at 79th Street and Cedar Avenue in Bloomington, Minn., the one-story building is owned by the Bloomington Development Co. It is leased to the Government Employees Mart (G.E.M.), a retail store selling merchandise at discount prices.

The architects of the building were Manuel Morris & Robert Sixta of Kansas City, Mo. Dutton Biggs of the same city was the structural engineer. The Minneapolis office of the Portland Cement Association assisted the contractor in problems relating to this type of construction.

The roof structure is composed of 44 hyperbolic paraboloid shells. The shells are joined by tie bars at their edges. Each of the umbrellalike shells (measuring 46 feet 4 inches×48 feet 6 inches) is carried by a 24-inch-diameter concrete column. The shell is generally 3 inches thick, although it is deeper at the ridge and edge beams.

Each shell is made up of four diamond-shaped hyperbolic paraboloids joined to each other by the ridge beams. The distance from the floor to the low point on the outside edges of the shell is 14 feet; the distance from the floor to the high point at the column is 22½ feet.

UNION

The *UNIQUE Wire Rope Organization

**Single in Kind or Excellence*

Customers can be credited for Union's outstanding position.

Why? Simply because in large numbers they accepted Union's standing invitation to share their wire rope and sling problems with Union's technical, research and engineering staff.

In meeting these challenges, Union has compiled an outstanding record in wire rope advancements. Some 1600 standard wire rope constructions are in day-to-day production under statistical quality controls which insure "the ultimate low cost rope." This means quality so good that it costs less in the long run.

In searching for better answers to wire rope and sling problems for customers, Union engineers developed the famous family of Tuffy wire ropes and slings.

Each member of the Tuffy family is of a special construction tailored to one of the tougher wire rope jobs. In the Tuffy constructions there is balance—the right combination of strength, flexibility and resistance to wear for better performance and greater safety. When you say Tuffy, you specify the "Ultimate low cost" wire rope or sling.

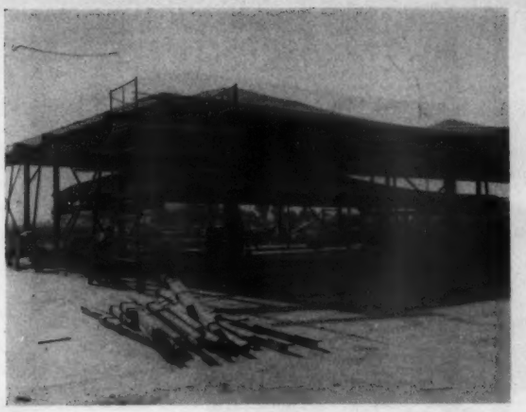
Tuffy® Wire Ropes and Slings

Tuffy Balanced Dragline Rope

Tuffy Balanced Scraper Rope

Tuffy Balanced Dozer Rope

jacking frames hold a form section for half a shell is to be raised into position. Each frame supports the at two points. The form rests on an armlike exten- welded to a sleeve that is pulled up the vertical 6- pipe by cable.



The two form sections for a shell are lowered by steel jacks 48 hours after concrete has been placed. Workmen, backing off on the hand winches to lower the jacks and drop the form, will next push the form forward on the rolling jacks and into position for the next shell to be erected.

An American Econmobile 620 with boom attachment carrying a ½-yard bucket brings concrete from transit mixers to the forms. It also handled masonry blocks. Heavy equipment could not use the 4-inch floor slab.

g Paul, The King of Spades, world's largest electric power shovel. In taking 105 ton bite (2 rail carloads) it imposes a maximum bail pull upon the wire pes of 550,000 lbs. One-half mile of wire rope is required in its operation by Peabody Coal Company at its modern River King Mine, Freeburg, Ill.

Look Up Your Union Distributor In Phone Book Yellow Pages

He's selected for his ability and willingness to supply you with the right Union standard or Tuffy wire rope construction, to check for proper installation and coach your operators in proper use to get the ultimate in service life. He is backed up by a nearby Union branch office and warehouse. If you would like to receive Union's Rope Dope Educational Bulletin, write Union Wire Rope Corporation, 2260 Manchester Ave., Kansas City 26, Mo.

Tuffy Wire Rope Tips on Safe Use of Wire Rope and Slings

On the Blink from a Kink

Mishandling of rope caused this open kink. Avoid kinks by proper winding on the drum. Never pull a loop smaller. Enlarge it, then straighten out the rope.

Overloaded - Soon Exploded

The rated capacity of a wire rope is based on breaking strength divided by the load factor for particular type of service. Grade of steel, type of construction and size of rope determine tensile strength. Unless rope is properly related to loads, costly and dangerous early failures are likely to occur.

Mangled in a Wedge Socket

Here's a result of improper socketing, caused by poorly designed or worn-out wedge socket. Can be costly and hazardous!

Victim of the "Bends"

Excessive bending of rope speeds up wear. General rule: use more flexible ropes as bending stresses increase (with decrease in tread diameter of sheave or drum). If sheaves are too small, early rope failure is certain.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, 2260 Manchester Ave., Kansas City 26, Missouri.

UNION Wire Rope

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1-C

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Forms for four shells

Four complete sets of forms kept production rolling on the roof structure. Each shell was built with two form sections. Each of the form sections was built of ¾-inch plywood on 2×6 framing. The framing was supported by two truss rafters and a 2×14 on the straight outer edge. The wood trusses were nailed together and were of comparatively light weight. The cost of the forms was about $1.30 per square foot, or about 12 cents per square foot based on 11 re-uses.

Four jacks per shell

Four jacking devices, built by the contractor, lifted the two form sections into position for each shell. After the forms were in place, they were supported by 4×4 shores on about 5-foot centers. When the concrete had cured (about 44 hours after placement), the jacks were again moved into position to lower the form so that it could be rolled to the next column.

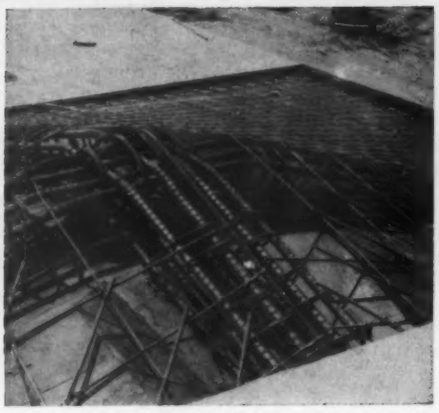
Best system

This system was found to be more desirable than keeping the jacks in position while the concrete was being placed and cured. The 4×4 shores distributed the load on the 4-inch concrete floor. Their frequent spacing made it possible to design lightweight trusses. (With jacks supporting the forms only at the edges, a much stronger truss is required.) With the contractor's system, the set of four jacks could be put to use while the concrete was curing.

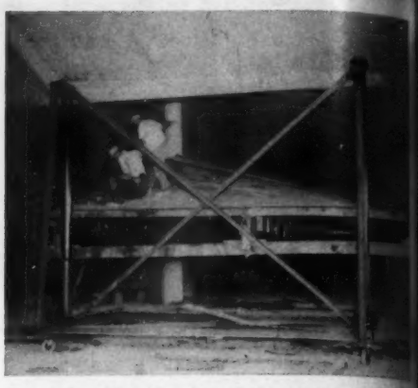
Each of the jacks had two arms that lifted the form. The lifting force was applied by cable and hand winch. The steel-frame jack was basically made up of two vertical 6-inch pipes. Steel sleeves were pulled up the pipes by cables as the winches were turned. Arms projecting from the sleeves lifted the form. Wheels on the jack allowed it to be pushed from column to column.

When the forms were in position, the light network of reinforcing steel was wired in place. The weight of the steel in the shell averaged only 2.25 pounds per square foot. Heavier bars —up to a No. 10—were used to strengthen the four ridge beams. A better tie was obtained between the

Concrete is placed in strips about 10 feet wide across the width of a shell. Pipe screeds control the 3-inch depth of the mix. Since the Econmobile could not quite reach the peak, a work platform was used by crews transferring concrete to the top of the shell.



Heavy steel stems out from the central column and follows the four ridges of the shell. The top 3 feet of each supporting column was placed monolithically with the shell to provide a better tie between ridge steel and the concrete of the column.



The roof completed, workmen start wrecking the forms. The form section is built of two nailed truss rafters and one 2×14 on the outer edge. These three members support 2×6 framing with plywood decking. The jacking frame still holds the form.

(*Continued from preceding page*)

ridge steel and the column by placing concrete for the top 3 feet of the column monolithically with the shell.

The placing of concrete for the shells was complicated by the requirement that no heavy equipment could operate on the 4-inch floor slab. To get concrete from the ready-mix trucks to the forms, the contractor made use of an American Econmobile 620. The fork-lift on the rubber-tire rig was substituted for a short boom handling a ½-yard bucket. The hydraulically controlled boom is a standard attachment for the rig.

The 30 cubic yards of concrete for each shell was placed in about 10-foot-wide strips. Pipe screed bars, resting on the reinforcing steel, controlled the 3-inch depth of concrete. The 2-inch-slump concrete was vibrated as it was placed.

The 4,000-pound concrete contained 7 sacks of high-early portland cement per cubic yard and 3 to 4 per cent air entrainment. Moving of the forms was permitted after about 44 hours, when a strength of 3,200 psi had been obtained.

Roof and walls

The top of the completed shells received a 1-inch layer of insulation (Fesco board), topped with a 4-ply roof. Two of the layers of felt were placed at right angles to the other two.

Unlike some hyperbolic paraboloid construction, this particular design provides a horizontal roof edge. This simplified the construction of the exterior walls. Two walls of the building are of 12-inch exposed concrete block. The other two are of 8-inch block with a 4-inch brick veneer. Interior partitions are built of 6-inch concrete masonry. The ceiling is composed of the exposed shells, sprayed with acoustical plaster.

Gordon Madsen of George Madsen Construction Co. was the project manager on the building. The superintendent was John Marxhausan.

THE END

Austin-Western Roller-Compactor

Saves cost of second machine!

"Our A-W Roller Compactor does the work of two pieces of compaction equipment, saving the cost of an additional machine. It makes possible the placement of a 10-in. stone base in a single course.

"On one hilly highway job we encountered an unusually slippery limestone aggregate. The A-W Roller-Compactor was the *only* equipment we had which could compact loose material on grades of 1% or more under its own power. Without it, we would have had to tow rollers up hill to get the job done." —*W. O. Faylor, Middlecreek Construction Co., Winfield, Pa.*

Three-shoe vibratory unit attaches to Austin-Western and most other makes of 3-wheel rollers. Vibration penetrates to bottom of lift, reacts upward and effectively keys low-level material for maximum consolidation in fewest passes. Compactor attachment combines with 3-wheel roller to deliver both surface-sealing static pressure and deep-reaching vibratory action in one pass. Dependable under severest operating conditions; easy to maintain. Learn how you can reduce compaction costs. See your nearby Austin-Western distributor today or write us for facts and figures.

Vibratory widener attachment — for use with Roller-Compactor unit on most makes of 3-wheel rollers. Mounts right or left; ends need for trench roller.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

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"We find that the MOBILE B-27 and B-52 PACEMAKER give us maximum security and ease of operation," say C. J. and M. C. Aimi . . . owners of the Illinois Drilling & Testing Company, Elmwood Park, Illinois. The Aimi brothers have over 20 years of varied drilling experience in North and South America, Europe, Asia and Africa.

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In Arlington Heights, Illinois, the lightweight B-27 and multi-purpose B-52 were teamed up on a foundation testing job for a new high school. They logged 156 Shelby tube and split spoon samples using MOBILE Hollow Stems and 6" continuous flight augers. According to C. J. Aimi, *"The B-27 and B-52 give us maximum security with regard to performance and ease of operation. Rugged and versatile, either machine can easily sample 100' per day even in unpredictable Chicago area soils."*

Write today for details on complete line of MOBILE hydraulic-powered rotary drilling equipment . . .

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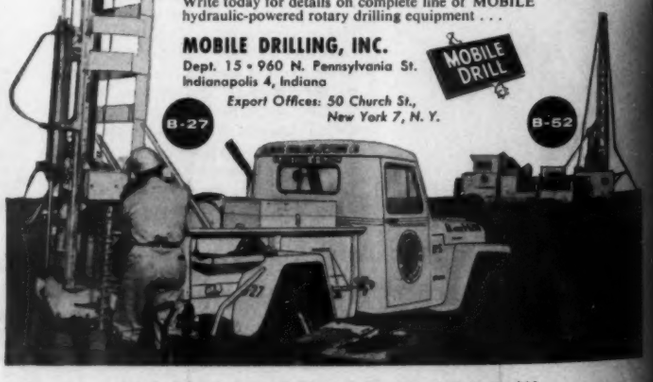

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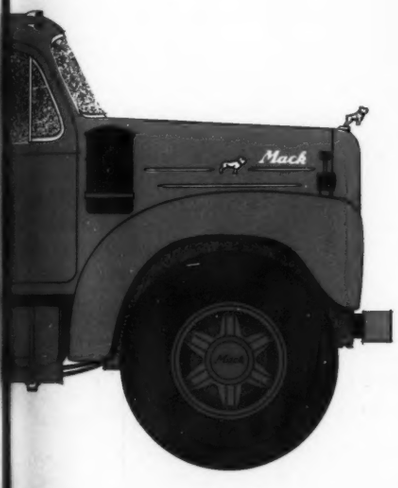
MACK BALANCED DESIGN



gives you more for each truck dollar

Mack Balanced Design is achieved by engineering and building components which work together with maximum efficiency. Only Mack can offer Balanced Design because only Mack makes all its own major components... makes them to standards of ruggedness and precision accomplished nowhere else. Mack Balanced Design results in a truck whose engine, clutch, transmission, axles and suspensions all work in harmony to produce an uncommonly smooth, powerful, responsive unit.

There's a MACK

Mack B-40 Series—5 to 10 yards as rear dumpers, 5½ to 7 as mixers

They combine big-truck power, capacity and stamina with small-truck agility and economy for service as dumpers, tractors, mixers and platform trucks. 150 hp Mack Magnadyne gasoline engine. Wide choice of Mack transmissions up to 20-speed units, in on-highway and off-highway versions. Choice of heavy-duty axles and frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers offer Mack Balanced Bogie with Power Divider. All-wheel-drive units as well

every construction job

Mack B-60 Series—6 to 12 yards as rear dumpers, 5½ to 8 as mixers

These trucks have hung up records for economy and long mileage life on every kind of job—as dumpers, mixers, tractors and platform trucks. The "workhorse of the industry," they're powered with Mack Thermodyne 185 hp gasoline engines, or Thermodyne diesel engines of 170 or 205 hp. Wide choice of Mack transmissions up to 20-speed units, in both on-highway and off-highway versions (depending on model). Choice of heavy-duty axles as well as frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers feature exclusive Mack Balanced Bogie with Power Divider.

There's a MACK fo

Mack B-80 Series—7 to 14 yards as rear dumpers, 7½ to 10 as mixers

Here's Mack profit-power personified! Big, rugged B-80's can be custom-assembled to meet your needs exactly: as tractors for heavy-duty hauling of platform or dump trailers . . . or as truck chassis for dumper, mixer or utility service. Wide option of power and gear ratios. Available in 4- and 6-wheel models including six-wheel-drive units. Powerful, durable braking power.

Up to 222 hp Mack gasoline or 205 hp Mack Thermodyne diesel engines; up to 335 hp stock diesels. Choice of Mack transmissions including Mack 20-speed Quadruplex. Mack Dual Reduction rear axles and—on 6 wheelers—Mack Balanced Bogie with Power Divider. Power steering standard on Mack front-wheel-drive models. Optional on others.

Mack "L" Series—15-40 ton end-dumpers to 50-ton bottom dumper

The Macks in the "L" Series—LRX, LVX, LYSW, and the giant LRVXT tractor which pulls 50-ton bottom dumper—are designed with the power and strength to handle the biggest construction jobs. They shrug off the relentless pounding of big-yardage shovels, and are loaded with features for top performance, long life and freedom from downtime.

Rugged power trains offer up to 450 hp diesel engines . . . Mack overgeared transmissions or torque converters and Mack Planidrive rear axles . . . powerful air brakes of latest design handle steepest descents . . . maneuverability characteristics of smaller vehicles—thanks to ideal power steering and air-assisted clutch.

For end-dumper capacities up to 40 tons, where maximum flotation is required, a full line of tandem rear axle Macks is available.

MACK BALANCED DESIGN

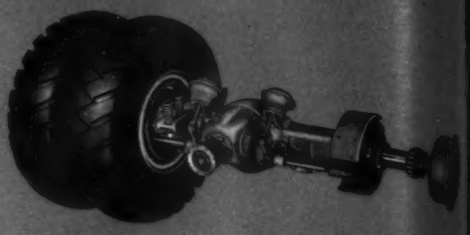
MACK for over 5 straight years NO. 1 by far in sales of diesel trucks

means components integrated for longest prime of life.

Only Mack offers these exclusive quality components:

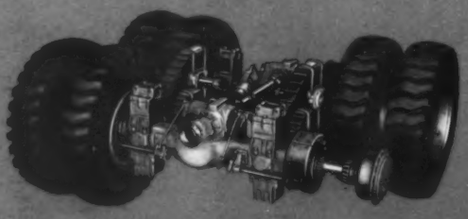
Strong Mack-built axles

Mack's drop-forged I-beam front axles are made super strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. And Mack's exclusive **front-drive axle** (shown above) for all-wheel-drive trucks offers the greatest ground clearance and strength of any made—with all parts fully enclosed.



Durable Mack-built 2-wheel rear axles

Mack's two-wheel, rear-axle assemblies have an unmatched reputation for service under strenuous conditions. Dual Reduction carrier and Mack's famous Planidrive gear reduction at the wheel hubs provide the smooth distribution of power vital to top truck performance.



High-traction Mack-built Balanced Bogies

Macks perform where other trucks bog down—in mud, loose gravel or sand—thanks to Mack's exclusive Balanced Bogie with Power Divider—a 4-wheel drive, tandem rear-axle assembly with an inter-axle differential that distributes the power to wheels with greater traction. To achieve maximum road clearance in larger units, Mack Planidrive final reduction gears in all 4 hubs eliminate the need for outsized carriers and low-slung differentials.

Long-lived Mack-built transmissions

Service records prove that Mack transmissions—like this 20-speed Quadruplex—stand up to heavy-duty hauling far longer and need less attention than any others—thanks to the use of the finest gear metals known...to painstaking precision manufacture...and to exclusive Tetrapoid gear design that gives maximum strength, longer life and smoother action. Five- to twenty-speed units, each with ideal ratio steps.

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Workers place the final section of the crown-shaped welded-wire fabric over double-bulb angles at the center of the ceiling slab in the south portal of the northbound tube of the Fort Pitt Tunnel, Pittsburgh. Sand-cement cubes under the fabric, at left, chair it up away from the ceiling tiles.

Ceiling construction moves swiftly for Fort Pitt Tunnel

Ceiling construction on the Fort Pitt twin tunnels in Pittsburgh, just one operation in a $10.6 million job, is an example of how progress was speeded by unusual design details and construction techniques. The ceiling is a reinforced slab, 5½ inches thick, 14 feet above the roadway and closing off a 7½-foot arched space.

Welded-wire fabric for reinforcing was preshaped into a crown section to span the gap between the half-tunnel widths of fabric and go over the center double-bulb angles. With the crown-shaped section of fabric in place and securely tied to the half-tunnel widths, and the bar reinforcing bent down and tied to the welded wire, a continuous network of reinforcement was attained.

Four Blaw-Knox 50-foot-long steel forms, faced with plywood, were in constant use. Two of the forms were under the two previous ceiling pours, one form was under the current pour, and the fourth served as a working platform for the placement to be made on the next day. All work progressed from north to south. The forms were moved by a single traveler unit, which lowered the steel-plywood section hydraulically and moved back toward the south portal, or working side. The traveler unit rode on steel rails laid on the previously placed roadway slabs.

To place the ceiling tile, a layer of gummed paper, sticky side up, was attached to the top of the plywood forms. The tiles were properly spaced, face side down on the dampened gum surface, and the next day, a dry grout was brushed over and between them, and sprinkled. One-inch cubes of sand-cement were distributed over the grouted tiles to act as chairs for the wire-fabric reinforcement. All reinforcement was placed and tied, and concrete was placed 5½ inches deep.

The concrete was pumped in by an overhead line, which was made shorter as work progressed toward the south portal, where the Rex Pumpcrete unit was stationed and fed by transit-mix trucks. Pozzolith was added to the mix.

Forms for the ceiling slab were stripped 56 hours after the concrete had attained a compressive strength of 2,500 psi. The gummed paper usually came away with the plywood, but was hosed off if necessary, leaving the exposed face side of the tile in its finished state.

NEW-BURCH Dump Body Mounted SPREADER

A unique development in box-type spreaders

All operations are controlled by driver in the cab. He raises or lowers the spinner for variable widths of spread, and controls the volume flow of materials.

Spreads full width or half width on either side.

- Reliable 20½ hp motor.
- Bar flight conveyor belt.
- Precision built, oversize reduction worm gear drive.
- Sealed automotive type reduction gear operates spinner.
- Heat treated gears and shafts.
- Roller or ball bearings throughout.
- Hopper supported by heavy structural channel sills and has a sturdy sectional top screen.

The BURCH Corporation
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS
CRESTLINE, OHIO, U.S.A.

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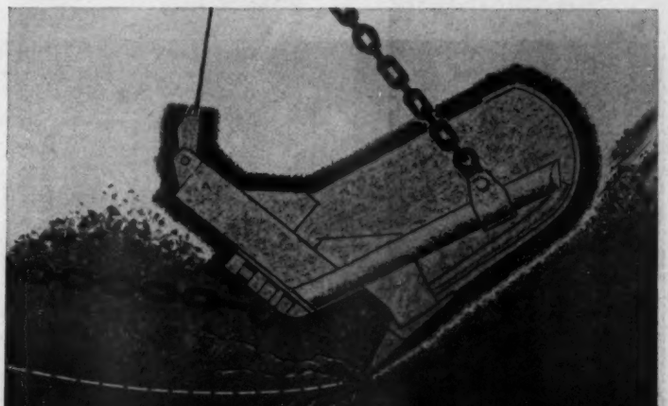
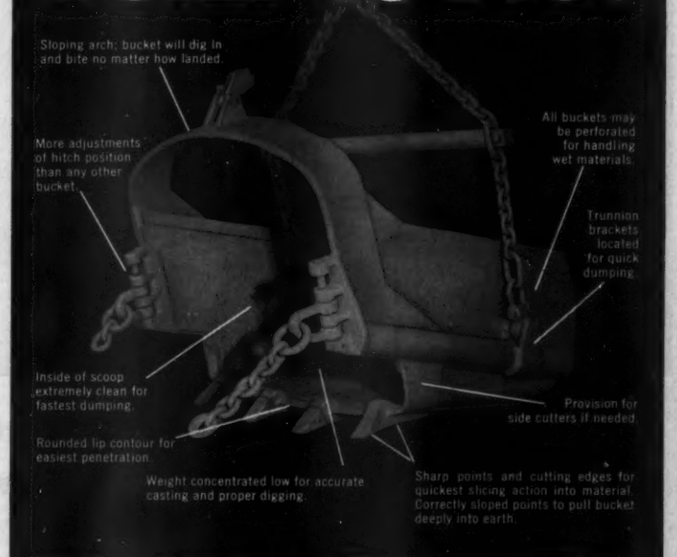


BUILT TO DIG!


Sloping arch: bucket will dig in and bite no matter how landed.
All buckets may be perforated for handling wet materials.
More adjustments of hitch position than any other bucket.
Trunnion brackets located for quick dumping.
Inside of scoop extremely clean for fastest dumping.
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Rounded lip contour for easiest penetration.
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Sharp points and cutting edges for quickest shoving action into material. Correctly sloped points to pull bucket deeply into earth.

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Tunneling a 20-foot horseshoe-shaped tunnel through solid granite is proceeding at a steady rate of 50 feet daily in the Rock Creek tunnel on the Mammoth Pool tunnel project. The crews are using Gardner-Denver No. 93 drifters and Bethlehem-Pacific 1¼-inch steels with Brunner & Lay Rok-Bits for the 12-foot rounds.

Crews break record for rock tunneling

Paddy O'Dowd and his crews were determined to set a new record for hard-rock tunneling—and they did! Each Monday morning, they made a big mark on the tunnel wall, and each day they recorded their progress. Finally, the breaks came their way. In six working days, they drove 390 feet of the 20-foot horseshoe tunnel through the hard granite, shattering the previous record of 301 feet.

This new record was established on the Mammoth Pool tunnel project in the solid granite of the Sierra Nevada mountains near North Fork on the San Joaquin River about 65 miles northeast of Fresno, Calif. Here, Utah Construction Co., San Francisco, has a $12.5 million contract with Southern California Edison Co. for the construction of the 8-mile power tunnel.

The old record for a similar tunnel was set in 1954 by crews of Walsh Construction Co. on a Pacific Gas & Electric Co. tunnel on the Feather River Development in northern California.

O'Dowd is portal superintendent for Utah in charge of the crew at the outlet portal of the project. Tunnel excavation is progressing simultaneously from four other headings. Two of these are at the Rock Creek adit near the middle of the job, and the other two are at Shakeflat Crossing, where a steel conduit will tie two sections of the tunnel across a valley near the upstream end.

Project manager Boyd C. Paulson and the rest of Utah's supervisory staff share Paddy O'Dowd's pride in that particular week's accomplishment. But they are equally proud of the over-all progress of the work, which has seen each heading advance at a steady rate of about 50 feet per day. The difference in production between the record week and other weeks was largely due to little delays caused by such things as equipment breakdown, unsuitable rock, and the necessity for placing timbering or roof bolts.

Part of large project

The tunnel is just one part of Southern California Edison Co.'s $50 million Mammoth Pool Project. An earth-fill dam 950 feet long and 330 feet high is being constructed across the San Joaquin River high up in the Sierras to create the storage and regulating reservoir that makes the project possible. The dam

CHALLENGE!

CAN WE MEET THE NEW COMPETITION?

"In the forty years that have elapsed since its Revolution, Russia has devoted a far larger portion of its gross national product to education than have we. As a result of this intense commitment to education on the part of the Soviets, we as a nation are presented for the first time with a challenge to our leadership in all of the values that we cherish.

"If we rightly interpret the significance of this event, our first reaction of dismay and consternation will herald a rededication of ourselves to the beat that we have learned from our first century of educational effort. We have a longer and a stronger tradition, greater resources in depth and diversity, a freedom of enterprise, and a talent for innovation which can all combine to more than redress the present balance and carry us to new heights of educational accomplishment if we display the requisite wisdom and determination."

GAYLORD P. HARNWELL
President, University of Pennsylvania

WE CAN AND MUST MATCH THEIR ZEAL—because our strength as a nation will depend on how we treasure and build our educational assets. Yet the hard facts are these:

1. Low salaries are not only driving gifted college teachers into other fields but are steadily reducing the number of qualified people who choose college teaching as a career.

2. Many college classrooms are already overcrowded yet in less than ten years entrance applications will double in number.

You can help in this crisis, one of the gravest in our history. Support the college or university of your choice—now!

For further details of what this can mean to you and your children write: HIGHER EDUCATION, Box 36—Times Square Station, N. Y. 36, N. Y.

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ADVERTISING COUNCIL PUBLIC SERVICE

HIGHER EDUCATION KEEP IT BRIGHT

A double-deck truck jumbo carried on a Euclid is used in drilling the Rock Creek adit. The jumbo carries Gardner-Denver hydraulic drifters. Six and 12-foot steels were used.

Mammoth Pool power tunnel is pushed 390 feet through solid granite in six-day work week

is being built by Bechtel Corp., San Francisco.

From the reservoir, the power tunnel leads the water through the mountain, roughly paralleling the river valley to the outlet portal, where steel penstocks will carry the water to the power plant. Two turbines and generators operating under a head of roughly 1,100 feet will provide a generating capacity of 126,000 kw. The tunnel contract also includes the construction of a large surge tank located near the outlet portal.

Storage and regulation provided by this project will allow power to be generated at this powerhouse and additional use made of the river for power development in downstream plants and, eventually, for irrigation in the valley below.

Tunneling operations at the outlet portal and Rock Creek adit headings are practically identical; the operations at Shakeflat Crossing are slightly different.

Drill 12-foot rounds

Crews at the outlet and Rock Creek headings use gantry jumbos, each mounting ten Gardner-Denver No. 93 drifters and one No. 123 drifter. Six and 12-foot steels, made up in the job shop from Bethlehem-Pacific stock, are fitted with Brunner & Lay carbide-insert Rok-Bits. Bit-sharpening facilities are set up at the three portals, but all of the steel is made up in the central blacksmith shop at the Rock Creek job headquarters. This well equipped blacksmith shop is operated by two brothers, Jack and Daniel Boyle.

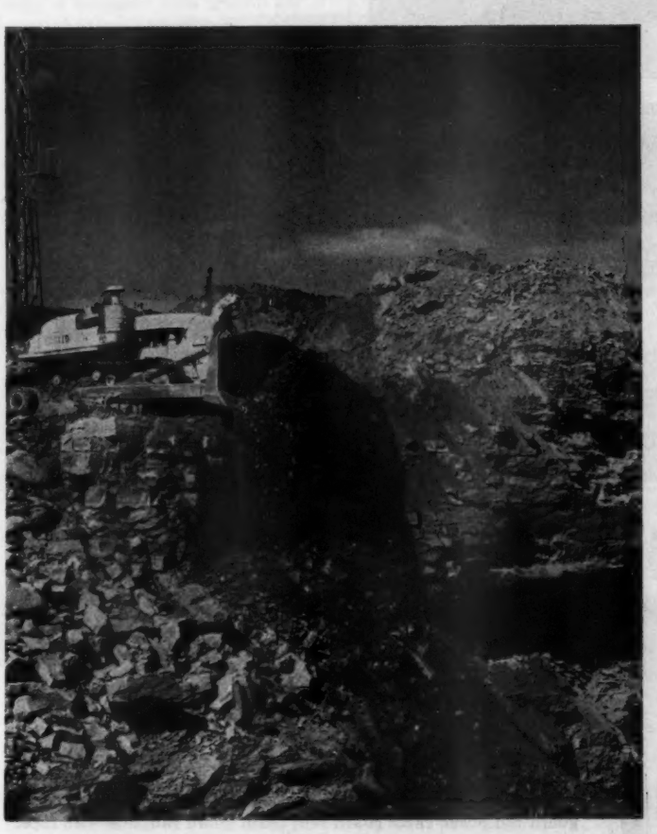
The average round of approximately 90 1⅝-inch holes is drilled to the 12-foot depth and loaded in about two and one-quarter hours. The holes are loaded with Atlas dynamite and Hercules primers, using a combination of millisecond and regular delays on a pattern developed by Utah's explosives consultant, R. L. Mullen.

The shots produce an average of 10 feet of tunnel and 135 solid cubic yards of muck. Goodman Conway 100 and 101 muckers load side-dump cars, which are shuttled in and out of the tunnel by Goodman battery-powered locomotives.

The gantry jumbos are fitted with cherry-picker hoists that pick an empty car off the track to permit the loaded cars to pass underneath and

(*Continued on next page*)

For more facts, circle No. 327→



"CLASH-BOX" robbing your CASH-BOX?

Crawlers without full-power shift are obsolete . . . and costly!

If your crawlers have master clutches and manual shift transmissions—"clash-boxes" as they're commonly called—you may be passing up profits that should be yours.

With proven Torqmatic Drive in the Model C-6 and the TC-12, Euclid Crawlers provide full-power shift and instant reverse. There's no loss of power or momentum when changing from one speed range to another . . . no delay for clutching and shifting . . . and with a flick of the wrist you change travel direction fast. It's a dependable power train, too . . . proved in thousands of "Euc" earthmovers on every kind of job.

Have your dealer show you how Euclid Crawlers have more productive capacity on any tractor work . . . dozing, ripping, push loading big scrapers, or towing heavy loads. The seconds they save on every work cycle can add up to more cash in your cash box!

Proven Torqmatic Drive provides smooth steady flow of power . . . full-power shift . . . instant reverse . . . easy operation. For push loading scrapers the fast maneuverability of "Euc" crawlers cuts scraper cycle time and steps up production . . . changes from one speed range to another, and from forward to reverse and back again, are made under full power . . . there's no clutching.

EUCLID Division of General Motors, Cleveland 17, Ohio
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

A cherry-picker car passer attached to the gantry jumbo picks up an empty car from the front of the muck train and raises it high enough for the train to pass underneath. The car will then be lowered to the track and pushed to the mucker by the engine.

(*Continued from preceding page*)

speed the switching behind the mucker. Additional switching is provided by portable "California switches" and permanent passing tracks.

Use main-line jumbo

On the two headings at Shakeflat Crossing, a main-line jumbo is used for the drilling. It carries 11 Gardner-Denver No. 93 drifters on tripod booms and uses the job-made steels and Brunner & Lay Rok-Bits. When the drilling crew completes a round at one heading, the jumbo is towed out of that tunnel and pushed back into the tunnel on the other side of the valley, where the same crew continues drilling.

At the same time, the mucking crew shuttles from one heading to the other in a similar manner. Motorized car passers in these tunnels handle the car-passing operation immediately behind the Conway muckers.

Still a third type of operation was used to open the 600-foot-long Rock Creek adit and start the two tunnel headings from this point. Here a truck-mounted jumbo carried the drilling and loading crews. An Elmco 105 loader mucked into four Koehring Dumptors.

Air for all of the drilling operations is supplied by eight 1,800-cfm electric-powered Joy compressors located in three compressor houses. The air is piped to the headings in 6-inch Naylor Spiralweld pipe fitted with Victaulic couplings.

Ventilation is provided by exhausting air from the headings through 30-inch Naylor Spiralweld pipe. Joy 27-inch Axivane blowers are mounted in pairs in the vent pipe at about 3,000-foot intervals. As the tunneling progresses, additional sections of vent pipe and more blowers are added to maintain the exhaust volume.

In the downstream heading from the Rock Creek adit, the miners encountered a large source of water that hampered operations for some time. At a maximum, 6,000 gpm was being pumped from this heading and discharged through the adit. This flow gradually decreased to an almost negligible amount after several months.

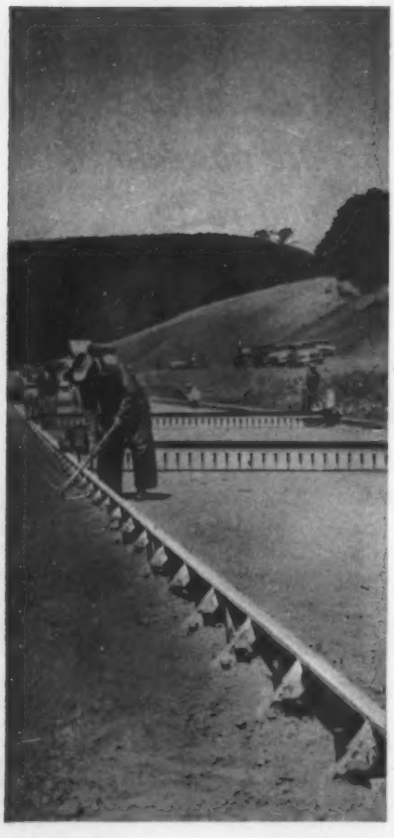
Except for the few sections of steel lining, the tunnel will be unlined. The invert is paved with a 6-inch slab shaped to a 100-foot radius. Forms are set to grade at the sides of the invert, and a vibrating slip screed shapes and finishes the concrete.

The mix is batched from a Noble batch plant that is being moved from one portal to another as the work progresses. The plant discharges the batches into 11 Smith 7½-yard transit mixers mounted on rail cars. The electric-powered mixers give the concrete its initial mixing period at the plant site. Then they are towed to the heading, where they are again plugged in to continue the mixing and to discharge their loads onto a conveyor that feeds the concrete to a Rex 200 double Pumpcrete. The two lines from the Pumpcrete feed through a wye to a single 8-inch line that deposits the mix on the tunnel floor ahead of the slip screed.

Radio communication

Although the tunnel is just 8 miles long, road distances through the rugged mountainous country are much greater. The distance from the out-

Paving the Penn-Can Highway



Welcome addition to Pennsylvania's fast-growing system of superhighways is the new Penn-Can Highway, stretching from Stroudsburg north to the New York State line near Binghamton.

Part of the Interstate Highway System, the new road will be concrete, generally four lanes wide, with a 60-ft median strip.

Shown here is the Lycoming Construction Co., Inc. of Williamsport, Pa., paving a section of the Penn-Can Highway near New Milford. A number of Bethlehem steel products for highways were used in constructing this section, including reinforcing steel for pavements and structures, dowel units, hook bolts, guard rail posts, cable guard rail, beam guard rail, and wire rope.

Single Source for Highway Steels

Bethlehem supplies the largest line of steel highway products in the country. Beginning with steels for the right-of-way, on through steel products for drainage systems, bridges, tunnels, road-paving, and bridge and highway guard rails, you can get all your highway steel products from one source—Bethlehem.

Write or phone the nearest Bethlehem sales office for full details. No obligation to you, of course.

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For more facts, use Request Card at page 18 and circle No. 328

The mucker uses a conveyor to load an 8-yard side-dump car.

let portal to the Rock Creek adit is 18.7 miles by road, and it is 25.2 miles from Rock Creek to the Shakefiat Crossing. The road was built for the Forest Service under a timbering contract. Although it has a good blacktop surface, its grades and curvature limit safe speeds to the 20 to 30-mph range.

Because of these factors, and the long distance to Fresno where the contractor maintains purchasing facilities, communications presented one of the major job problems. A solution was found in the use of a General Electric mobile radio system, which includes a repeater station atop a mountain, combined with telephones. Ground cables provide telephone communications for the three portals. Through connections to Southern California Edison's microwave system, these job telephones are linked into the Bell and local telephone systems.

Barracks and mess halls are maintained by the company at two of the three work areas, and a large percentage of the workmen live right on the job. The others have their families in several trailer camps scattered through the mountains or in the villages of North Fork and South Fork.

Personnel

Over-all supervision of the tunnel project and its crew of 600 men is handled by project manager Boyd C. Paulson and his staff, which includes general superintendent Steve Wilmoth, project engineer A. J. "Al" Simoneaux, and business manager H. W. Johnson. Portal superintendents are Paddy O'Dowd, "Heavy" Holman, and Jack Robertson. C. A. Banks is master mechanic, and John Burke is electrical superintendent. Utah Construction Co.'s main job office is at the Rock Creek site.

Bechtel Corp., which is serving as engineer for the power company on the tunnel project, is represented by Homer Castonia and Frank Landers. The entire project is supervised for Southern California Edison Co. by project engineer Harold A. Barber and resident engineer Neville S. Long. THE END

Clark Equipment film on tractor-shovel line

■ "The Fifteenth 'Michigan' " is a 20-minute sound and color, 16-mm film on job applications of the Michigan-line fleet of 15 Model 175A, 275A, and 375A tractor shovels owned and operated by Irving Bros., Indiana crushed-stone, sand, and gravel producer. The rigs are shown at the pits loading out trucks, maintaining stockpiles, etc.

Film showings may be arranged by writing to the Construction Machinery Division, Clark Equipment Co., Pipestone Plant, Benton Harbor, Mich.

For more facts, circle No. 329→

Clinton announces dates for next engine schools

■ Clinton Engines Corp., Maquoketa, Iowa, will hold engine-school sessions at the Maquoketa plant during the weeks beginning March 21, April 4, and April 11. The chain-saw school will be held during the week beginning March 28. Each course is limited to 24 students. A $20 registration fee is required; the only other cost is for transportation to and from Maquoketa and a few meals, since Clinton pays for hotel rooms and lunches.

Applicants may make arrangements through any Clinton distributor.

By recommending the right explosive for your needs!

Blasting efficiency begins with explosives selection and Cyanamid offers contractors a single source for a complete line of high quality explosives and accessories. You can rely on Cyanamid's explosives engineer to recommend from this line the right explosive for *your* job, based on long experience and a knowledge of your specific job conditions.

Cyanamid's complete line includes:

Standard Gelatins — water resistant gelatin dynamites, 40% and 60% commonly used for construction work. High velocities impart a shattering action to surrounding area.

AJAX® Dynamites— semi-gelatinous explosive with high weight strength and low density characteristics. Cohesive explosives with good water resistance. In many operations, they offer means of reducing cost per foot of borehole due to their lower cartridge cost.

Ammonia Dynamites — low cost dynamites adapted for general, all-round work. Slower rates of detonation make them well suited for soft rock blasting, hard rock work where maximum shattering is not desired and for earth excavation. Grade strengths from 20% to 60%.

Blasting Agents — now being used in construction jobs employing larger diameter holes. Available under tradenames Accomite* and Accomite WR. Requires suitable primer for detonation.

Electric Blasting Caps — instantaneous, split-second or regular delay. Split-second caps are manufactured in 25 millisecond intervals for periods A-1 through O-15. Regular delay caps are manufactured in 10 delay periods. All types have leg wires insulated with four coatings of Organosol for high water and abrasion resistance, improved electrical insulation and greater flexibility at a wide range in temperature.

Blasting Caps and other Blasting Accessories.

*Trademark

Don't forget Cyanamid's job-winning *Pre-Bid Service!*

By conducting a careful pre-bid investigation, Cyanamid's explosives engineer offers contractors valuable assistance in estimating hard-rock blasting costs. Next time you bid on a hard-rock job, let an experienced Cyanamid explosives engineer help you *get* and *do* the job!

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AMERICAN CYANAMID COMPANY
MINING CHEMICALS DEPARTMENT
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Manufacturers Memos

Paul Duke, vice president and director of L. B. Foster Co.

Paul Duke has been elected vice president and director of the **L. B. Foster Co.**, Pittsburgh. He has managed the company's regional office in Atlanta since it was established in 1955.

Daniel E. Grow has been appointed to the newly created post of sales manager of the Industrial Time Sales Division of **James Talcott, Inc.**, New York City.

Edward J. Eckert and **Weldon D. Beezley** have been named vice presidents of the company's newly established industrial time sales subsidiary, James Talcott Western Inc., 510 S. Spring St., Los Angeles. Eckert will have charge of credits and operations; and Beezley will head new business activities. This firm will specialize in the financing of installment sales and leases of income-producing machinery and equipment of all types to manufacturers, dealers, and distributors in California, Oregon, Washington, Nevada, Utah, Arizona, and New Mexico.

Harnischfeger Corp., Milwaukee, is decentralizing its sales organization by dividing the United States into three major sales regions, with a sales manager in each region. **William H. DeHuff** is in charge of the western region, with headquarters in San Francisco; **J. C. Huntington, Jr.**, central and southern region, with headquarters in Milwaukee; and **J. E. Laffey**, eastern region, with headquarters in Teterboro, N. J.

The Utility Division of **Highway Trailer Co.**, Edgerton, Wis., has appointed **Baxter L. Schroeder** its Western regional sales manager. He will be in charge of sales programming for the division in all states west of the Mississippi River and in the western provinces of Canada.

Two vice presidents have been appointed by **U. S. Steel Corp.**, Pittsburgh. **Truman H. Kennedy** heads operations, and **Robert E. Williams** is chief of sales, both in the firm's National Tube Division. Kennedy succeeds **Edmund G. Price**, who has become executive vice president of the division. Williams succeeds **Henry J. Wallace**, the division's new president. **Louis W. Mason** is the new general manager of sales for the division.

Christian F. Beukema has been named president of the Oliver Iron Mining Division to succeed the late **Rudolph T. Elstad.**

Thomas W. Hunter has been appointed general manager of steel operations for the parent company.

The Timken Roller Bearing Co., Canton, Ohio, has appointed **R. L. Frederick** to the new post of executive director, International Division. He will be in charge of coordinating all of the company's international operations. His first concern will be with manufacturing in overseas locations, giving special emphasis to coordinating methods and programs designed to produce quality products with the greatest efficiency.

Two have joined **Sika Chemical Corp.**, Passaic, N. J. **John A. Heinen**, an engineer in the technical service department, will answer customers' technical inquiries dealing with concrete technology and construction. He will work in the home office.

E. Harold Nelson has joined the firm's Boston district office as a sales engineer, covering the Connecticut-Massachusetts area. Nelson will assist architects, consulting engineers, contractors, and public-works officials with information on using admixtures in concrete construction.

Western-Knapp Engineering Co., San Francisco, has named **Edward S. Frohling** its business-development engineer in the Eastern District. He will be responsible for business-development activities throughout the eastern United States, with headquarters in New York City.

More proof that...

AMSCO HELPS YOU MOVE MORE TONS PER DOLLAR

How AMSCO screen parts and Simplex 2-Part Dipper Teeth are giving users greatly improved service life*

AT A LARGE NEW ENGLAND QUARRY

AMSCO CHUTE PLATES LAST 5 YEARS VS. 4 WEEKS FOR PREVIOUS TYPE

In the screen house of this quarry, two Amsco HC-250 abrasion-resistant chute plates are used on each Hi-G discharge screen. 500 tons per hour pass over each plate, during the two-shift, 20-hour operating day.

This installation resulted from a previous test, in which a set of Amsco plates was compared with regular carbon steel plates. The Amsco Chute Plates *lasted about 5 years*, whereas the competitive plates had to be replaced every 4 weeks.

The quarry operator reports that the Amsco plates presently installed are holding up excellently in service. Their exceptionally long life and trouble-free service means big dollar savings—through elimination of costly shutdown time.

ON THE NIAGARA POWER PROJECT

AMSCO SIMPLEX 2-PART TEETH DIG 40,000 YARDS OF ROCK BEFORE REPLACEMENT

At the right, you see the type of rugged rock excavation in which this outstanding service record was set. It's part of the Niagara Power Project—Conduit #2 South—being handled by Gull & Defelice Construction Company.

All dippers on the job are equipped with Amsco Simplex 2-Part Reversible Teeth. They operate 16 hours a day, 6 days a week—*handle approximately 40,000 yards of rock*—before tooth replacement is required.

In addition to their exceptionally long wear, the fact that Simplex Teeth *can be replaced in ten minutes with no trouble* is an important advantage to the operators. It all adds up to big savings—in replacement cost and shovel downtime. *Patent No. 2,904,908

Wherever high impact and abrasion are problems, you'll "move more tons per dollar" with Amsco Dippers, Dipper Teeth and Crusher Parts. See your equipment dealer, or write us direct for technical bulletins.

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

AMERICAN Brake Shoe COMPANY

Barber-Greene Co., Aurora, Ill., has reorganized its field sales management setup. Field sales activities of resident district sales managers will be supervised by newly appointed Eastern and Western regional sales managers. Regional sales manager for the Western Division is **Ralph Dano**; and **Kent Shell** holds the same post for the Eastern Division.

New field sales manager is **Tom Benbow**, who will supervise all company district sales managers and train field engineers. He, Dano, and Shell will have headquarters in Aurora.

Fuller Mfg. Co., Kalamazoo, Mich., maker of heavy-duty transmissions, has promoted **Frederick K. Stull** to the post of factory manager, succeeding **Merle Payne**, who has retired. Since 1953, Stull has been Payne's assistant.

Assistant sales manager for **Universal Form Clamp Co.**, Chicago, is **Gary Cass**. He will supervise the training of new salesmen and distributor salesmen, in addition to other sales management functions.

The new sales manager of blast-hole drills for **Bucyrus-Erie Co.**, South Milwaukee, is **William G. Barnes**. For the past two years he has been sales engineer for blast-hole drills.

Jefferson J. Davis, executive vice president of Electric Steel Foundry.

The new executive vice president of **Electrical Steel Foundry Co.**, Portland, Ore., is **Jefferson J. Davis**. He was formerly vice president in charge of the company's Product Divisions.

Three management appointments have been made in the Great Lakes division of **Armco Drainage & Metal Products, Inc.**, Middletown, Ohio. **George R. Betts** becomes assistant division manager; **William A. Carleton**, division sales manager; and **Walter O. Woodhouse**, manager of Lansing, Mich., district sales.

Several personnel changes have been made by **Trailmobile Inc.**, Cincinnati. **George C. Rangos** is now manager of the Baltimore, Md., sales and service factory branch. **G. S. Holcomb**, new national used-trailer manager, and **William Starkweather**, new service sales manager, are stationed in the home office. **William P. Morgan** is used-trailer manager of the Midwest Division at Hammond, Ind. **Paul W. Campbell**, manager of national accounts and fleet sales, has headquarters at the New York City office. **R. W. McDowell** is manager of the Birmingham, Ala., sales and service branch.

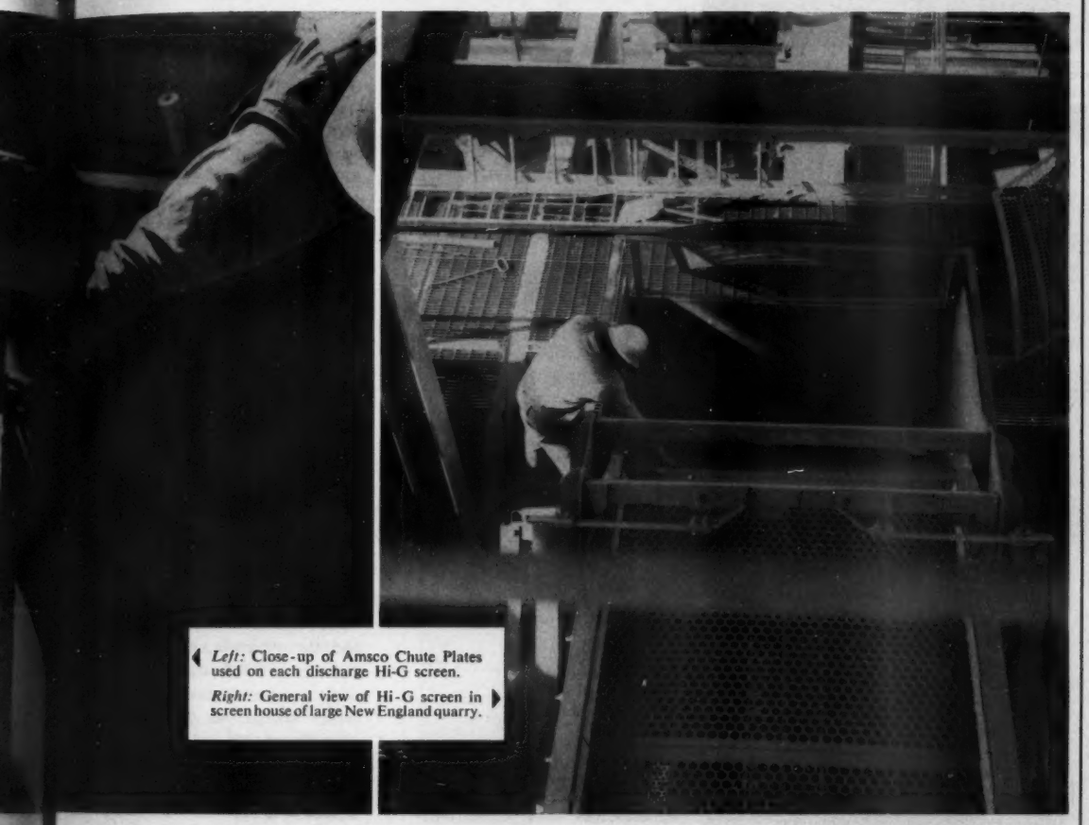
L. C. Doss is manager of the newly created special products department. The department will promote the sale of trailers and components manufactured outside the Trailmobile plants.

Robert P. Fox and **E. W. Taylor** have joined **American Hoist & Derrick Co.**, St. Paul. Fox is chief engineer of revolver cranes, hoists, and derricks. He will be responsible for all engineering concerned with these and related products. Taylor, as manager of the Engineered Projects Division, will have charge of engineering on bridge cranes, powerhouse gantry cranes, and other equipment of a special nature.

The new general manager of **Pemco, Inc.**, Roselle, Ill., is **Robert M. Litschewski**. He will have full responsibility for all manufacturing functions, as well as product development, for the company, which makes paving equipment.

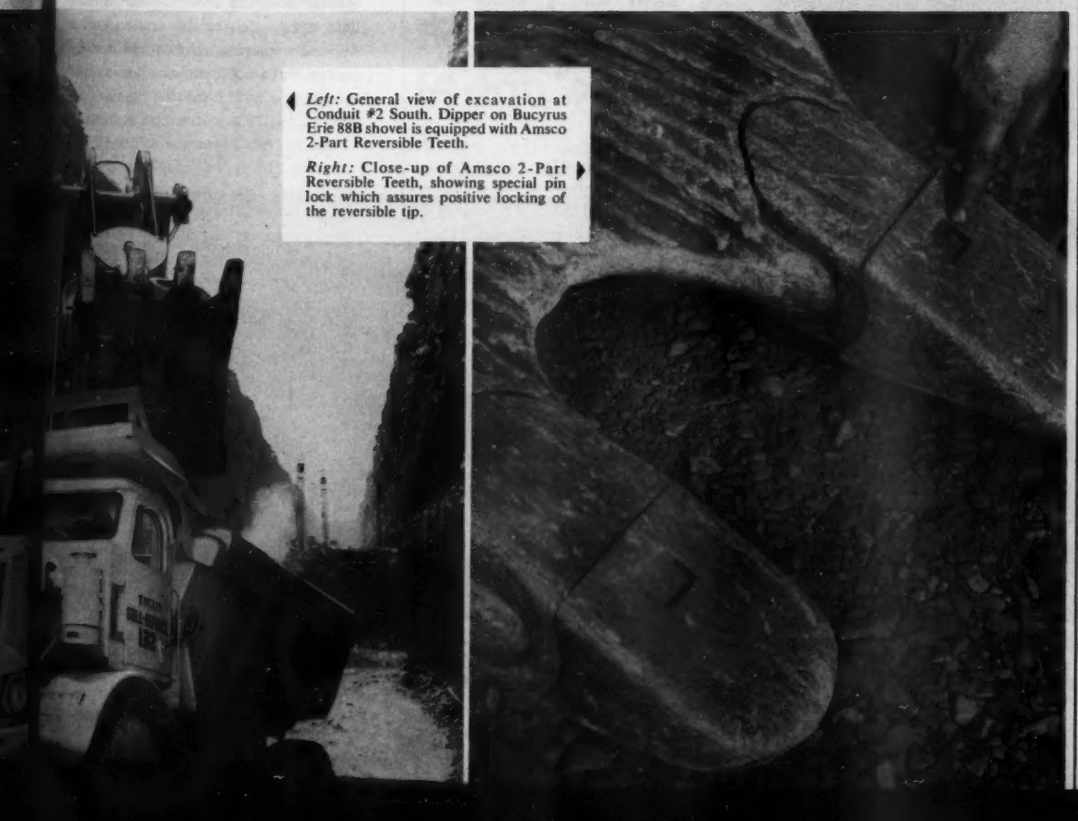
Dayton Sure-Grip & Shore Co., Miamisburg, Ohio, has acquired an additional manufacturing plant in that city. Production of high chairs, slab and beam bolsters, strap ties, loop ties, etc., will be transferred to the new plant at 721 Richard St. A number of new reinforced-concrete accessories will also be made there.

←For more facts, circle No. 330



Left: Close-up of Amsco Chute Plates used on each discharge Hi-G screen.

Right: General view of Hi-G screen in screen house of large New England quarry.



Left: General view of excavation at Conduit #2 South. Dipper on Bucyrus Erie 88B shovel is equipped with Amsco 2-Part Reversible Teeth.

Right: Close-up of Amsco 2-Part Reversible Teeth, showing special pin lock which assures positive locking of the reversible tip.

Paving train meets spec for jet-base runway

"Blackboard" system of grade control used in paving asphaltic-concrete widening strips

by TONY MAVROUDIS, field editor

Two Multifoote pavers place an average of 875 yards of concrete per 9-hour day during work on a 2,100×300-foot runway extension at Seymour Johnson AFB, Goldsboro, N. C. Tough base and paving specifications were in effect to provide a runway capable of taking 100,000-pound wheel loads. The Ford truck has a 4-batch capacity.

The Blaw-Knox spreader that strikes off the mix pulls Maginniss electric vibrators through the 21 inches of concrete. The spreader also pulls a Lewis transverse finishing machine.

The Lewis float-finisher, combining the features of a transverse finisher and a floating rig, moves down a 25-foot lane. Alternate lanes were paved, the pavers working outside the forms; closure lanes were then filled in.

The second Lewis rig has two transverse screeds, a contractor-rigged separator bar and, at the rear, a V-shaped float. The separator bar in front of the screeds is a 25-foot hydraulically operated steel plate that separates aggregates at the transverse-joint locations to help double blade life of concrete saws.

The V-shaped float at the rear of the second Lewis rig does not ride on forms or on completed lanes; it is simply suspended from the frame of the machine. Here it is being pulled over a paving lane. A burlap drag will complete the surface of the slab so that curing spray can be applied.

Tough specifications had to be met by the paving contractors working on the widening and extending of the primary runway at Seymour Johnson AFB, Goldsboro, N. C., to accommodate the Air Force's B-52 jet bomber. The pavement—capable of handling wheel loads of 100,000 pounds—an operational alert apron, and taxiway, and service facilities were built under a joint-venture contract.

N. Ryan Co., Inc., and Westbury Paving Corp., both of Brooklyn, N. Y., handled the $3,157,400 extension and widening of the runway, which was 9,658 feet long and 150 feet wide. The runway, having a 4-inch asphaltic-concrete wearing surface, except for 1,000-foot-long end sections of 15-inch-thick concrete, was extended 2,100 feet and widened to 300 feet.

The existing runway surface was supported by an 8-inch crushed-stone base, an 8-inch clay-gravel subbase, and the subgrade, which was compacted to a CBR of 15. The 15-inch-thick end sections consisted of concrete having a 28-day flexural strength of 650 psi.

The contractor widened the runway by adding 75 feet of 4-inch asphaltic concrete on each side. The 4-inch covering was placed in two lifts, a 2½-inch binder course and a 1½-inch wearing surface. It is supported by an 8-inch crushed-aggre-

Widening of the existing runway by 75 feet on each side is done by a Pioneer paver, which is putting down the 11-foot-wide 1½-inch wearing surface. To meet required grade tolerances, paving crews used a "blackboard" method for showing the amount of mix required at 25-foot intervals.

An Erie batch plant supplies the dry mix for the paving train. A 30-inch conveyor fed by a truck hopper brings aggregates to the bins. Cement storage silos are charged by separate enclosed elevators.

gate base course, a 10-inch sand-clay subbase having a minimum CBR of 40, and a subgrade with a CBR of 15.

Design spex

The 2,100×300-foot runway extension, which provides a primary runway 11,758 feet long and 300 feet wide, is of portland-cement concrete of varying thicknesses. The nonreinforced concrete slab, 21, 19, or 17 inches thick, is supported on a 6-inch subbase having a K value of 250, a uniformity coefficient exceeding 4; and a coefficient of curvature between 1 and 3. These specifications had to be met for the pavement to handle the 100,000-pound-design wheel load.

The uniformity coefficient is determined by dividing the 60 per cent passing stone size by the 10 per cent passing size of stone. This sieve analysis also helps determine the coefficient of curvature, which is calculated by squaring the 30 per cent passing size and dividing that value by the 10 per cent passing size multiplied by the 60 per cent passing size.

Another design consideration, obtained from the Unified Classification System used by the U. S. Army Corps of Engineers, Bureau of Reclamation, and the Navy Bureau of Yards and Docks, prohibits the flow of material from one base course into another. This design criterion was applied to all courses under the portland-cement and asphaltic-concrete pavements.

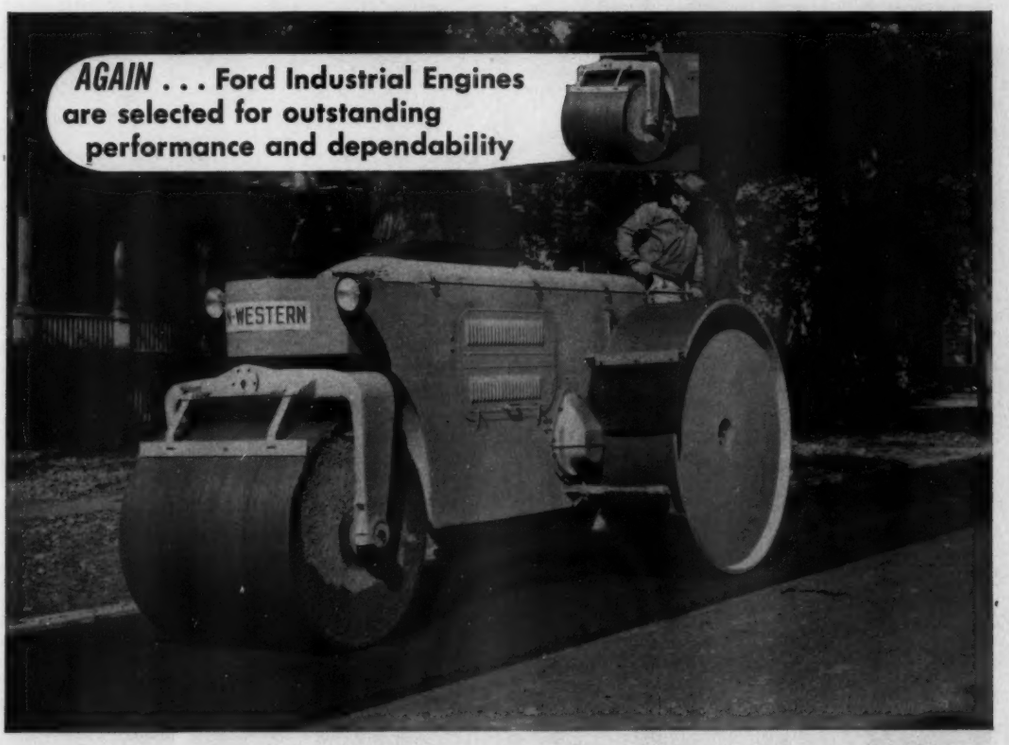
It states simply that the 15 per cent size of the coarsest layer cannot be greater than 5 times the 85 per cent size of the finest layer. These specifications prevent the intermingling of the aggregates under the pavement when vibrations are set up by aircraft.

Paving operations

Ryan and Westbury used two Multifoote double-drum pavers, traveling outside the forms. When closure lanes were being paved, the rigs traveled on completed lanes.

The concrete mix for the 25-foot lanes was dumped in front of a Blaw-Knox spreader equipped with rear-mounted Maginniss vibrators that extended to a point 3 inches above the base course. The spreader also pulled a Lewis double-screed transverse finishing machine. This rig was

(*Continued on next page*)



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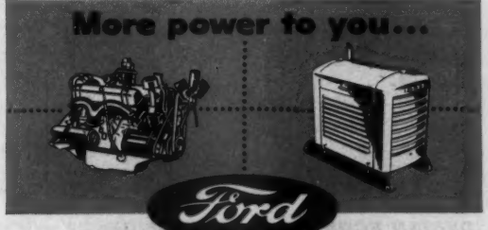

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For more facts, use Request Card at page 18 and circle No. 331

Compaction of the asphaltic-concrete paving is done just behind the paver by a Buffalo-Springfield 3-wheel tandem 18-ton roller.

(*Continued from preceding page*)

followed by another Lewis machine equipped with two transverse screeds, a V-shaped float, and a contractor-rigged separator bar.

The latter addition, mounted in front of the screeds, consisted of a steel plate, 25 feet long, that could be lowered or raised by the machine operator. It was hydraulically mounted on the Lewis finisher-float to separate the aggregates at the transverse joint locations. This aggregate, being of granite, made the joint sawing a tough job. By separating the aggregate from the mix at the joint locations—which were at 25-foot centers—the contractor more than doubled his sawing production per blade. Several types of blades were used with varying production rates.

Joint sawing generally was started 10 to 12 hours after the concrete was placed. The longitudinal joints were cut ¼ inch wide and 1 inch deep along the edge of each 25-foot paving lane. The transverse joints were cut ⅜ inch wide and to depth determined by dividing the slab thickness by 6. All joints were sealed with a jet-fuel-resistant filler.

The last rig in the paving train was a Heltzel Flex-Plane spray machine that applied Hunt white-pigmented curing compound over the slab surface. Ryan and Westbury used Heltzel 17, 19, and 21-inch steel forms for the paving job, which averaged 875 cubic yards of concrete placed per 9-hour day.

Batch plant

The contractor supplied the dry concrete mix from an Erie batch plant located on the air base. It consisted of a 120-ton 4-compartment aggregate bin, which included an enclosed cement-bin compartment. Two cement silos, with 900 and 700-barrel capacities and separate enclosed elevators, handled the cement storage. Cement was shipped by rail to a nearby unloading point where it was transferred to trucks that hauled to the batch plant.

The aggregate-bin compartments were charged by a Hewitt-Robins 30-inch conveyor belt, which was fed by a truck hopper. This procedure was supplemented by a Northwest crane that transferred aggregates from a stockpile. The plant was completely automatic and equipped with four pen recorders for each of the two sizes of stone, and the sand and cement. Water was furnished from a base water hydrant that also supplied the water tanks supplying the pavers. A contractor-built 3,500-gallon water tanker that supplied both pavers was equipped with three pumps, one for pumping from the delivering tankers and two to supply the pair of pavers.

Blacktop paving

Ryan and Westbury subcontracted the runway widening and blacktop paving to Nello L. Teer Co., Durham,

DESIGN ECONOMY AND CONFIDENCE with Monotube Piles . . . acting both as piers and foundations for this prestressed concrete beam bridge at Fenwick Island, Delaware. The high columnar strength of Monotubes makes their application ideal for this type of project.

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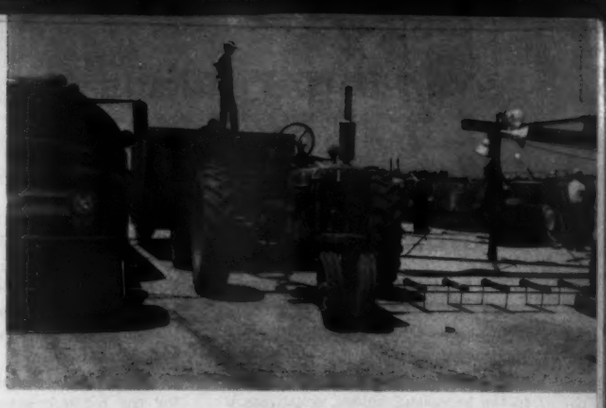
◄ A Heltzel Flex-Plane spray machine applies the Hunt white-pigmented curing compound to the new slab.



This tractor-drawn contractor-built water tanker with 3,500-gallon capacity supplies water to both pavers. It uses three pumps—two to send water to the pavers, one to pump water from the delivering tanker at right. ►

N. C., the prime contractor for the $1,389,570 operational alert apron located at the western end of the runway. Teer used a Pioneer spreader to place the 2½-inch binder course and the 1½-inch wearing surface for the 75-foot runway-widening strips. Each course, placed in 11-foot widths at an average of 60 fpm, was compacted by a Buffalo-Springfield 3-wheel tandem 18-ton roller.

Teer used the primed or tacked surface of the base and binder as a "blackboard" for a grade control to meet smoothness requirements (plus ⅛ and plus ¼ inch from a 12-foot straightedge for wearing surface and binder, respectively) and finished-pavement elevation tolerance of not more than .04 feet from theoretical grade between any two points 100 feet or less apart.

This procedure was followed: (1) spot-paint at 25-foot longitudinal intervals on spreader widths; (2) record the actual elevation with conventional level and rod; (3) compare this elevation with the required finished elevation for this course; (4) paint beside the spot the number of inches of material needed to obtain the finished grade. The screedmen then looked ahead to the painted number and adjusted the screed up or down, as required. This procedure enabled the contractor to complete the work to required elevation without a single instance of removal and replacement. The asphaltic concrete was supplied by the Teer quarry and plant located at Princeton, N. C.

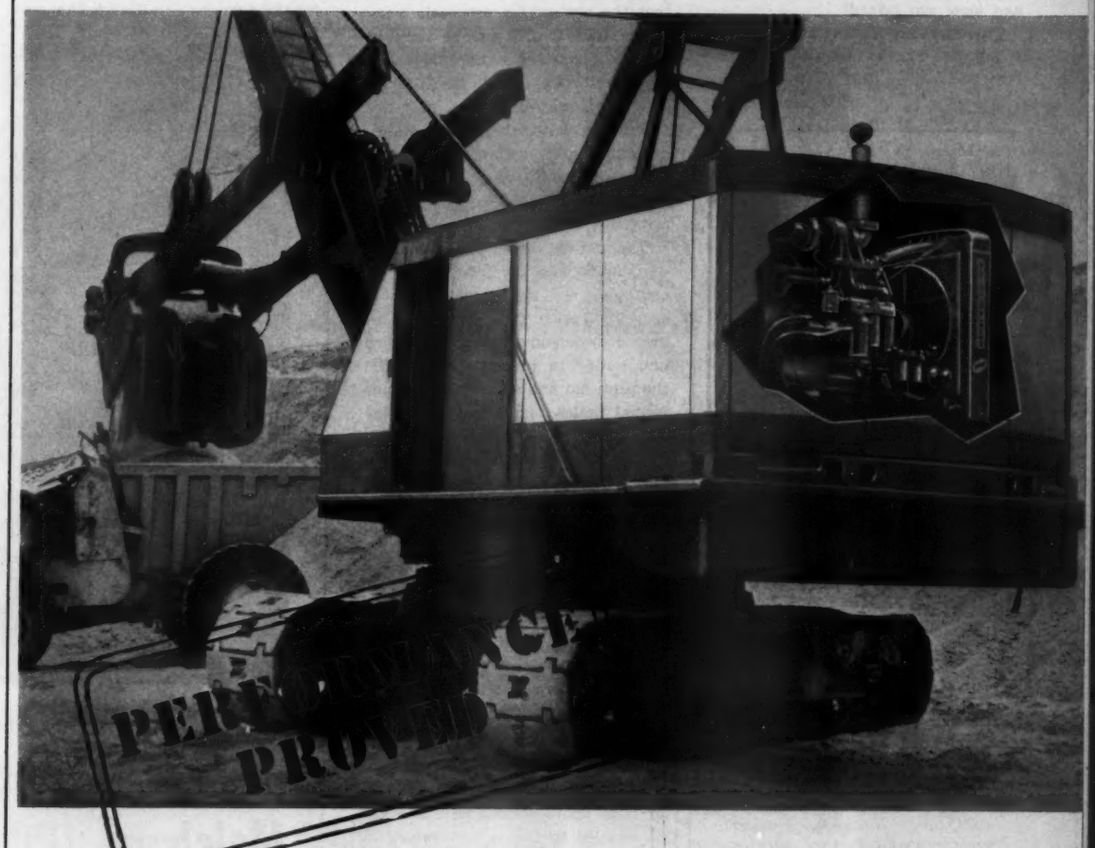
Personnel

James A. Comyns was the project manager and George Blackwell, the general superintendent for the Ryan and Westbury joint venture. Harry E. Lindsey is the resident engineer and John Grady, the assistant resident engineer for the Wilmington District, U. S. Army Corps of Engineers.

THE END

Alloy Rods appoints

■ Willard F. Stewart and Albert A. Averbeck have been appointed hardsurfacing specialists for the newly formed Hard Surfacing Division of Alloy Rods Co., York, Pa. Averbeck, assigned to the Chicago sales office, will work with the company's regular salesmen and distributors in the application of hardsurfacing materials and tool and die welding products. Stewart has the same assignment in the Pittsburgh office.



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Avoid legal pitfalls

Formal contract was not needed

THE PROBLEM: *Under the circumstances involved, did the government's request for proposals for building construction, the submission of a proposal, and a notice of award to the successful bidder, constitute a binding contract, although entry into a formal contract was contemplated and none was signed?*

THE ANSWER: Yes. (United States v. John McShain, Inc., 258 Fed. 2d 422, decided by the United States Court of Appeals, 422.) The court set aside a contrary conclusion by the United States District Court, District of Columbia.

The government sued for damages for the bidder's refusal to perform the work. The bidder denied the existence of a contract, pointing out that the request for proposals mentioned that they would be received "for the purpose of negotiating a contract for furnishing all plant, labor, materials, and equipment in strict accordance with the specifications, schedules, and drawings." The request also said that the successful bidder would be required to execute a specified government contract form.

Defendant's bid "proposed," in compliance with the request, to furnish what the request called for at a specified price. The government delivered to defendant notice of award and notice to proceed. It specified the price bid and said: "This is your formal notice to proceed under the contract."

The opinion mentions that the request was a voluminous document containing general conditions, several hundred pages of specifications, and incorporating by reference many drawings. Thereby, the court implies that nothing remained to be agreed upon or negotiated by the parties that was essential to a complete agreement on all of the terms of a contract.

The case had not been tried, the only question presented being whether, assuming that the government could prove the facts alleged by it as above summarized, it would be entitled to damages sustained by defendant's refusal to proceed. The affirmative answer by the court to that question was contrary to what the lower court had previously decided.

Employee was electrocuted

THE PROBLEM: *A hydrocrane was used by a subcontractor on a sewer construction job in placing a manhole cover. The top of the boom came in contact with overhead high-tension electric wires, 33 feet above the ground, and electrocuted the subcontractor's employee. Were the general contractors or the electric power company liable in damages?*

THE ANSWER: No. (Mikolasko v. New York State Electric & Gas Corp., 185 N. Y. Supp. 2d 95, decided by the New York Supreme Court, Appellate Division, Third Department.)

The court said that the electric company was not liable merely because it knew a sewer was being constructed. The electric company was not warned that a boom long enough to contact the overhead wires would be used. For like reason the general contractors were not liable.

State's liability for defects in spex

THE PROBLEM: *A state highway department let a contract for road construction. The plans and specifications obligated the contractor to compact the soil used as embankment material to a density complying with standard laboratory tests. When work started, it was found that the soil could not be compacted to the required density. Although it was notified, the department delayed for several months in complying with the contractor's request for adequate change orders. Was the state liable for the damages resulting to the contractor?*

THE ANSWER: Yes. (McCree & Co. v. State of Minnesota, 91 N. W. 2d 713, decided by the Minnesota Supreme Court.)

The decision took note of several points:

1. This being a suit for breach of contract, and not one for damages for negligence or other wrong arising under a contract, the state was not immune from suit because of its sovereign capacity.

2. The contract requirement for compaction to specified density involved an implied warranty by the state that it could be achieved if the plans and specifications were followed. The case was governed by rules applicable to both private and public construction contracts. These provide that one who has agreed to perform a contract for specified pay will not be entitled to additional pay merely

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because unexpected difficulties in performance are encountered. Ordinarily, a contractor bears the risk of subsidence of soil on which he has agreed to erect a structure. But, as declared by the United States Supreme Court, if he has bound himself to follow certain plans and specifications prepared by the owner, he is not responsible for defects in work due to defective plans and specifications. (Of course, this does not mean that he has a right to proceed with the work, especially without notice to the owner, after it appears that the plans and specifications are vitally defective.) As also shown by decisions of the United States Supreme Court, cited by the Minnesota Supreme Court, the rights of a contractor in a case like this one are not defeated by a contract clause requiring the successful bidder for a contract to visit the site, check the plans, and inform himself as to the requirements of the work.

3. By failing to take prompt steps to permit corrective measures suggested by the contractor, thereby delaying prosecution of the work, the state rendered itself liable for all consequential damages inflicted upon the contractor, and not merely for the increased cost of proper compaction. The damages collectible included reasonable rental of equipment idled, increased labor and material costs, increased overhead expenses, and any other expenses traceable to the delay.

A quarry zoning case

THE PROBLEM: *Owners of a tract of land had used it for limestone quarrying for many years. Adjacent property was used for quarrying, and the owners and lessees of the tract would have sustained a severe loss if extension of quarrying operations were prevented, as compared to a relatively small increase in inconvenience to owners of houses in the neighborhood. Was the village zoning ordinance, which forbade extension of quarrying operations on the tract, invalid as to the tract?*

THE ANSWER: Yes. (Herman v. Village of Hillside, 155 N. E. 2d 17, decided by the Illinois Supreme Court.)

Total disability of injured employee

THE PROBLEM: *An able-bodied carpenter, doing heavy-construction work at the time of his accident, by reason of his injury could no longer accept employment in his chosen occupation in the heavy-construction industry. His productive potential was impaired to the extent that he was restricted to performing light work, at reduced wages, and then only in pain and with the support of a back brace. Was he an industrial invalid and, under the Louisiana Workmen's Compensation Act, permanently and totally disabled?*

THE ANSWER: Yes. (Serpas v. W. Horace Williams Co., 160 Fed. Supp. 850, decided by the United States District Court, Eastern District of Louisiana, New Orleans.)

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Extra claim denied

THE PROBLEM: *A housing project's prime contract required the contractor to dispose of all debris and material not suitable or needed for fill. But a subcontract did not make a similar requirement, and the prime contractor had to pay the subcontractor extra for removing material. Was the owner bound to reimburse the prime contractor?*

THE ANSWER: No. (J. W. Bateson Co. v. Romano, 266 Fed. 2d 360, decided by the United States Court of Appeals, Sixth Circuit.) The court upheld a decision that had been rendered by the United States District Court, Eastern District of Tennessee, to that effect.

State sales-tax law

THE PROBLEM: *The Ohio sales-tax law provides that if a construction contract calls for incorporation of tangible personal property into a structure or improvement or as a part of real estate, it shall constitute a taxable sale if there are separate charges for the chattels furnished and for their installation.*

A concrete company contracted to furnish at its cost and expense "all labor, materials, tools, machinery, equipment, appliances, shoring, scaffolding, transportation, and all other necessary facilities and shall do all the work required for the execution and completion of fabrication, de-

Edited by A. L. H. STREET
Attorney-at-Law

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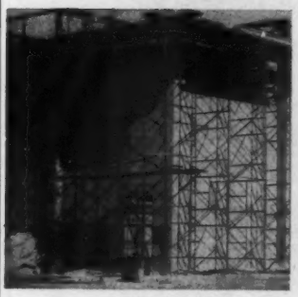
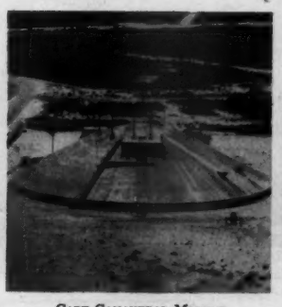

MINOT AIR BASE PROJECT
Minot, N. Dakota

ROUTE #15 BYPASS
Amity Hall, Pennsylvania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avoid legal pitfalls

livery, and installation of precast-concrete wall panels as required for the walls" of certain buildings of the owner. The agreed price was $2.46 per square foot of "panel installed complete on buildings," but it was specified that the price should be divided, allowing $1.85 per square foot as the "price of panels completed and accepted" stored either at the contractor's plant or the owner's plant site, and 61 cents per square foot as "the price of erecting the panels complete." Was a sales tax assessable on the price of the panels, $1.85, as distinguished from the price of erecting them?

THE ANSWER: Yes. (Marietta Concrete Corp. v. Bowers, Tax Commissioner, 156 N. E. 2d 312, decided by the Ohio Supreme Court.)

The court noted that the prices for the panels were not only agreed upon separately but were also charged and paid separately.

Attorney's fees

THE PROBLEM: *Equipment was leased to highway contractors. The lessors sued on the contractor's bond to collect unpaid rentals. Under California law, were the lessors entitled to have included in the judgment a reasonable fee to cover the services of their attorneys?*

THE ANSWER: Yes. (Maulhardt v. California Director of Public Works, 336 Pac. 2d 631, decided by the California District Court of Appeal, Second District, Los Angeles.)

Juvenile trespassers

THE PROBLEM: *Members of a paving contractor's crew knew that boys were taking gasoline from idled paving machinery and making bombs from it. No steps were taken to stop the practice. A 13-year-old boy stole some gasoline and spilled some of it on a fire in a yard a block away from the construction site; this resulted in injury to another youngster. Was the contractor liable?*

THE ANSWER: Yes. (Johnson v. Clement F. Sculley Construction Co., 95 N. W. 2d 409, decided by the Minnesota Supreme Court.)

Validity of awards to low bidders

THE PROBLEM: *Claiming that it had made a mistake in bidding on a state highway job, the lowest bidder sued to enjoin an award to him and a suit on his bid bond. The court decided that, regardless of whether he could establish a valid defense against a suit on the bond, he was not entitled to an injunction. But would the fact that the bidder was an unlicensed contractor give him ground for enjoining award of the contract to him?*

THE ANSWER: No. (Ottinger v. Blackwell, 173 Fed. Supp. 817, decided by the United States District Court, Eastern District of Arkansas.)

The court noted that although the Arkansas statute involved made it a misdemeanor to contract for work without having obtained a contractor's license, it was not so worded as to prohibit the making of such a contract.

It does not necessarily follow that the courts of other states would reach similar conclusions under similar statutes.

Scaffold accident

THE PROBLEM: *A construction foreman was injured when he fell from a scaffold. His employer, the contractor, had contracted with defendant, a scaffold company, to furnish and install the scaffold. If the accident was attributable to negligent installation, was the scaffold company, not the contractor, liable?*

THE ANSWER: Yes. (Baer v. Schaag, 97 N.W. 2d 207, decided by the Nebraska Supreme Court.)

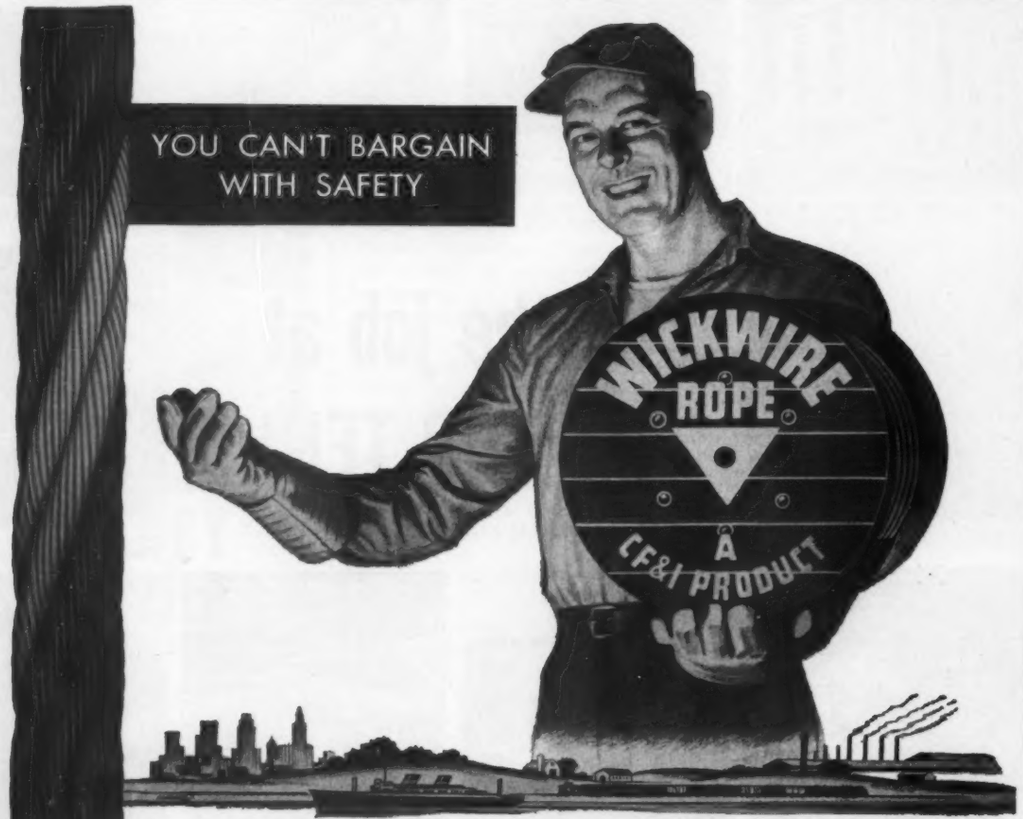
Bidding advertisements

THE PROBLEM: *A county board advertised for bids to furnish culverts. A statute provided that the notice be published for four successive weeks, the first publication to be at least 30 days before the day for opening bids. A notice was published only three times, and the first publication was made 17 days before the bidding date. Was a contract awarded under such notice void, precluding the contractor from collecting the agreed price?*

THE ANSWER: No. (Northwestern Sheet & Iron Works v. Sioux County, N. Dak., 36 N. W. 2d 605, decided by the North Dakota Supreme Court.)

The evidence showed that the county authorities and the contractor acted in good faith, and without intent to stifle bidding. The court distinguished the case from other cases where statutory requirements for competitive bidding had been disregarded and where attempts were made to collect the contract price, without regard to a reasonable value of work or materials furnished.

The court concluded that the county board attempted in good faith to comply with the law, that the purchase of the culverts was within the board's power, that they were received and used by the county, and that they were worth what the county agreed to pay for them.



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The special steel used in Double Gray provides extra resistance to the deforming effects of peening and crushing which occur on the drums and sheaves of heavy equipment. Double Gray also gives extra resistance to abrasion.

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For a free copy of our Double Gray booklet, write to: Advertising Department, The Colorado Fuel and Iron Corporation, 575 Madison Avenue, New York 22, N. Y.

**Wickwire Double Gray Wire Rope is made of extra-improved plow steel. Fortified by an independent wire rope core of the same extra high strength steel, Double Gray rope has a 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.*

6632

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque · Amarillo · Billings · Boise · Butte Denver · El Paso · Farmington (N.M.) · Fort Worth · Houston · Kansas City · Lincoln · Los Angeles · Oakland · Odessa (Tex.) Oklahoma City · Phoenix · Portland · Pueblo · Salt Lake City · San Francisco · San Leandro · Seattle · Spokane · Tulsa · Wichita

In the East: WICKWIRE SPENCER STEEL DIVISION—Boston · Buffalo · Chattanooga · Chicago · Detroit · Emlenton (Pa.) New Orleans · New York · Philadelphia

CF&I STEEL

For more facts, use Request Card at page 18 and circle No. 336

A helicopter lifts a 65-foot radio tower and antenna to be placed atop Fairview Mountain, Md. The entire 12-minute operation included pickup, 2-mile flight, and placement on a concrete base at the site.

'Copter places radio tower on its mountain base

■ An unusual operation involving ground-air communication recently resulted in the placing of a 65-foot radio tower atop Fairview Mountain, Md., about 10 miles west of Hagerstown. The 850-pound tower, carried to the top of the mountain by a helicopter, was bolted into place while the helicopter hovered overhead.

The tower is part of a state-wide microwave radio system for the Maryland State Roads Commission and the state police. Travelstead & Sons Construction Co., Inc., Baltimore, held the contract for construction of concrete bases and erection of radio towers and antennas in western Maryland. All of the other sites gave access to cranes for setting the towers. Fairview Mountain, however, was inaccessible because of the steepness of the upper third of the 1,500-foot mountain.

The tower was assembled two miles away and was picked up by the helicopter, which flew in a wide circle to get into proper position. Since the tower hung directly under the helicopter, the pilot was guided by radio signals from a pilot in a second helicopter, and by hand signals from a third man on the ground. The tower was set on the base's anchor bolts; then, after receiving a signal, the pilot cut the cable loose and flew back to the starting point. Time for the entire operation: 12 minutes.

G-D opens new office

■ A new office at 1629 University Ave., San Diego, has been opened by the Gardner-Denver Co., Quincy, Ill. Heading the office is Robert Scruggs, former field engineer.

Soiltest adds to staff

■ Paul Van Ael has joined the engineering staff of Soiltest, Inc., Chicago. He will be in charge of the company's engineering program in Europe, with headquarters in Breda, The Netherlands, the firm's stocking and distribution center for Europe, Africa, and the Middle East.

For more facts, use coupon or circle No. 337→

Free booklet offered on reinforced asphalt

■ Free copies of "Welded Wire Fabric Reinforcement of Asphaltic Concrete Overlays," a technical bulletin published last year by the American Road Builders' Association, are now available through the Wire Reinforcement Institute.

Those interested in learning the latest developments in the reinforced-asphalt process may obtain a copy of the 16-page illustrated booklet by writing the institute, Dept. 238, National Press Bldg., Washington 4, D. C. The bulletin is written by Edward M. Howard, field engineer of the institute.

The major portion of the booklet is devoted to practical hints and recommendations for the designer and the contractor, including a detailed discussion of the devices (mostly job-rigged) that assure successful handling of the wire fabric. Typical drawings (which may be adapted by designers), showing layout and positioning of the fabric in different applications, are included. Suggested asphaltic-concrete-mix specifications are also given.

The final section of the bulletin contains data on some of the special uses of fabric in asphalt, such as on wooden bridge decks, over steel bridge decking, and at bus stops and street intersections.

Dravo names manager

■ William H. Lehr has been appointed manager of equipment sales for the Engineering Works Division of Dravo Corp., Pittsburgh. He will supervise the sale of items requiring specialized mechanical and structural fabrication.

Big 12" SKIL pneumatic Super-Duty Saw has the depth of cut (4¾"), power and stamina to make short work of cutting heavy lumber for bridge and dam construction; in mines and shipyards. Ideal for heavy use where electric power is not available or where compressed air is more practical.

Just as this new super highway will cut off miles, the SKIL Model 77, 7¼" Super-Duty Saw zips through heavy plywood and bracing used to make concrete forms. Its performance and dependability has earned the Model 77 a solid reputation as "standard equipment" for general contractors.

Continuously—with amazing speed and ease—the 10" SKIL Super-Duty Saw rips through hardwoods, rough, heavy lumber and wet or resinous woods . . . stock up to 3¾" thick. Use it for both heavy commercial and construction jobs.

SKIL SUPER-DUTY SAWS

—strong "muscles" for big jobs

When it comes to making the tough jobs easy, powerful SKIL Super-Duty Saws are in a class by themselves. They have the ruggedness and stamina to stand up under heaviest day after day use on toughest construction jobs. Yet they deliver exceptional high torque and big cutting capacity . . . ideal for use wherever "right-to-the-job" portability, dependability, power and ease of operation are required. And SKIL Super-Duty saws give you all these features; Job engineered, dual-handle cutting control, telescopic blade guards, *all* ball-bearing construction, adjustable bevel scale, stepped up power and speed.

Whatever your construction job, versatile SKIL Super-Duty Saws can help you finish "on schedule". See your SKIL dealer or mail coupon for free copy of the 58-page Industrial Power Tool Catalog, containing detailed information on SKIL saws and other SKIL Power Tools.

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Round and round they go at the

AASHO Road Test

Trucks loaded with solid concrete blocks head down the concrete straightaway of an AASHO Road Test loop at Ottawa, Ill., and up the asphaltic-concrete straightaway. Outside lanes are used by tandem-axle trailers of identical loading. Inside lanes are used by single-axle trailers. The test loops will eventually become part of an interstate route.

The AASHO Road Test at Ottawa, Ill., is beginning an accelerated loading operation aimed at obtaining a greater number of load applications before test traffic is halted next summer.

The number of trucks operating on the test loops is being increased by about 65 per cent, and traffic has begun a 7-day-week schedule. This, says a project spokesman, is in accordance with the wishes of the sponsor, the American Association of State Highway Officials.

Prior to January 1, a fleet of 11 vehicles had been used in the testing operation. This fleet had accumulated nearly 6 million miles and made more than 375,000 axle-load applications to each pavement section.

Forty-eight additional vehicles have been purchased by the project and are being placed in service on the test loops. Forty are tractor-semitrailer types, and eight are small trucks.

Tentative plans call for test traffic to end next July 1. Ten more months will be needed for special post-traffic tests, data analysis, and report writing. Final reports will be published in 1961.

The trucks range from pickups with 2,000-pound axle loads up to large tractor and semitrailer combinations with 30,000-pound single and 48,000-pound tandem-axle loads. All vehicles in any one lane of a particular 2-lane loop have identical axle loads.

The drivers are men from a special U. S. Army Transportation Corps unit stationed at the test site. Until now, the soldiers have driven in two shifts, covering about 18½ hours per day, six days a week. They drive at a constant rate of 35 mph on the straightaway and slow down to 25 mph to make the turns.

The wheels of the trucks roll over 836 separate test sections. Half of the pavement is concrete, and the other half is asphalt. It is the job of the testing engineers to find out exactly what happens to the pavement when trucks with a certain load pass over it a certain number of times. There are also 16 bridges designed to permit study of behavior of structures under high stresses.

A complex system of electronic and mechanical instruments has been devised to measure the effects of traffic on the pavements. The instruments measure strain, deflection, temperature, and longitudinal and transverse profiles.

Electric transducers installed on or in the pavements include strain gages, thermocouples, frost-depth indicators, curvature strips, and conven-

Jaeger announces new high-performance pumps that are quicker and easier to maintain

NEW MODEL 3PN, above, pumps all the water a 3" suction hose can handle at 5' lift. Pumps 28,000 gph at 10' lift when a 4" suction hose is used. Sure-priming is correspondingly fast, at all practical suction lifts.

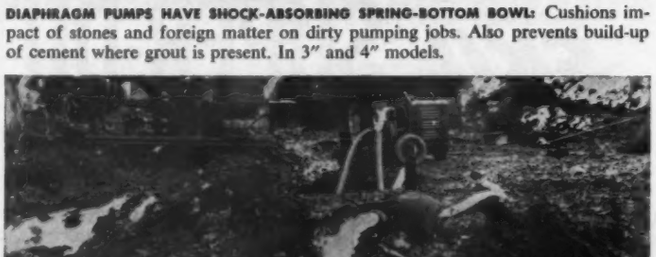
MODEL 3XPN is a comparably improved smaller 3" pump. We believe it is the finest pump you can buy under the AGC "15-M" rating.

LOOK HOW EASY TO MAINTAIN: New design of both pumps enables you to remove suction chamber and liner without removing volute, and quickly rotate or replace the liner plate or adjust its clearance with plastic shim gaskets. Maintains peak efficiency.

Jaeger pumps know how to handle water. For the right pump for any dewatering or pressure pumping problem, see your Jaeger distributor or send for latest catalog.

BIG CAPACITY FOR BIG JOBS: This Jaeger 10" is doing a fast job of dewatering a 43½' x 129½' x 26' deep cofferdam after the pouring of an 8' thick bridge pier foundation with 1500 cu. yds. of tremie concrete. With a Jaeger 6" pump also on the job, contractor had well over 300,000 gph of water handling capacity.

DIAPHRAGM PUMPS HAVE SHOCK-ABSORBING SPRING-BOTTOM BOWL: Cushions impact of stones and foreign matter on dirty pumping jobs. Also prevents build-up of cement where grout is present. In 3" and 4" models.



JAEGER 4P IS RIGHT PUMP FOR THIS 18' DEEP SEWER TRENCH: Provides big water handling capacity with portability on work where the pump moves with the job.

THE JAEGER MACHINE COMPANY, 701 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario

For more facts, use Request Card at page 18 and circle No. 338

Vans carry electronic equipment that can be plugged in at junction boxes along the loops to record strains and deflections in the pavement. Readings from electric transducers on or in the pavement are punched into paper tape.

tional linear differential transformers to measure deflection.

Measurements from these transducers are recorded on electronic equipment installed in movable vans. This equipment can be plugged to terminal boxes along the roadway to record transient behavior of the pavement at the same time the test traffic is running.

The recording equipment is designed to convert output of the electrical transducers into figures and to punch the data into paper tape. The tape is then brought into the project's data-processing center, where the information is transferred to punched cards. A fairly complete IBM setup is installed at the project for handling the data.

Analysis of the data will be done to a great extent on a Bendix G15-D digital computer, which is also installed at the project. However, some of the more cumbersome and time-consuming analyses will be done on larger computers at nearby universities.

Under the guidance of project director W. B. McKendrick, Jr., a staff of 160 people is currently working at the Road Test facility. The $22 million experiment is sponsored by The American Association of State Highway Officials and is being administered by the Highway Research Board of the National Academy of Sciences, National Research Council.

THE END

Mackinac Bridge film

■ A new movie, "Miracle Bridge Over Mackinac," portrays the building of the 5-mile-long Mackinac Bridge, which unites Michigan's Upper and Lower peninsulas. The 16-mm sound and color film describes how the piers were built as deep as 215 feet under water, despite strong currents and rough water.

Presented by Merritt-Chapman & Scott Corp., New York City, the 23½-minute film may be obtained on a free loan basis from any one of the four libraries of Association Films, Inc. The libraries are located at Broad and Elm, Ridgefield, N. J.; 561 Hillgrove Ave., La Grange, Ill.; 1108 Jackson St., Dallas, Texas; and 799 Stevenson St., San Francisco, Calif.

New sales managers for Yale & Towne

■ Louis W. Jander has been promoted to general sales manager of the Yale Materials Handling Division, The Yale & Towne Mfg. Co., Philadelphia. He succeeds Clyde R. Dean, now division general manager. Jander is in charge of domestic and Canadian sales of Yale's complete lines of industrial lift trucks, tractor shovels, and hoisting equipment through factory branches, franchised representatives, and industrial distributors.

Francis O. Boufford, former western regional sales manager for the division, has been appointed New York branch sales manager.

Gerald A. Tamblyn has been promoted to assistant general sales manager of industrial trucks.

The division has moved its Chicago industrial lift truck and Y-18 tractor shovel sales and service branch office to 9335 Belmont Ave., Franklin Park, Ill.

This Pipe is EXTRA Strong . . . EXTRA Safe . . . It's NAYLOR

The NAYLOR Wedgelock coupling makes a positive connection, securely anchored in standard weight grooved ends. A hammer is the only tool needed to connect or disconnect it.

NAYLOR Spiralweld pipe provides the practical way to get the economy of light weight without sacrifice of strength in your pipe lines.

Because of its exclusive lockseamed-spiralwelded structure, this distinctive pipe provides greater strength plus extra safety against shock loads, stresses and strains. And you get these advantages along with the light weight that saves time, work and money on handling and installation.

For air, water and ventilating lines, it will pay you to get the facts on NAYLOR pipe as well as on NAYLOR Wedgelock couplings. Just write for Bulletin No. 59.

NAYLOR PIPE Company

1270 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more facts, use Request Card at page 18 and circle No. 339

Dozer and belt load shot rock

Scrapers and rock spread move 16,000 cubic yards of material per day on John Day Dam excavation

Shot rock is loaded by a Cat D9 tractor with U-dozer and Kolman 70-foot×60-inch belt loader to Euclid end-dumps during work at the John Day Dam site in Washington. "Eucs" picked up loads in a few seconds for the railroad embankment around the Columbia River dam near Goldendale.

An unusual rock-handling combination consisting of a Cat D9 tractor-dozer and a Kolman 60-inch belt conveyor-loader handled shot rock directly from a cut into Euclid end-dumps with amazing ease and speed. This was one of the two spreads used by S. S. Mullen, Inc., Seattle, on the rough excavation for the spillway of John Day Dam on the Columbia River near Goldendale, Wash.

Mullen's Euclid scraper spread with Cat D9 and "Euc" TC-12 push-tractors loaded and hauled the common excavation. The two spreads together moved 16,000 cubic yards of material per day on a haul that averaged 7,500 feet; during the 150-day contract period they moved more than 1,200,000 yards.

Rock drilling is being handled by five Crawl-IR track-mounted drills, each driven by an I-R 600-cfm Gyro-Flo compressor. The 3-inch holes are put down about 20 feet in two lifts on an 8×8-foot gridiron pattern.

Material for the railroad embankment is unloaded by a Euclid TS-24 while a Cat D8 tractor-dozer shapes the fill.

A new Euclid TC-12 tractor arrives on the job and is made ready to take its place in the borrow pit. A Pitman Hydra-crane helps place the track, which had been removed for shipment.

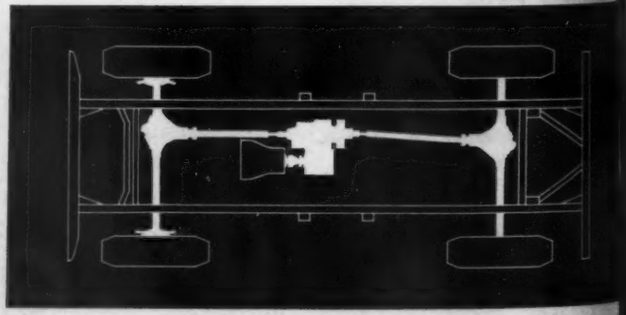
With Power-Matched Your Trucks Will Lick the

Only Spicer provides the operating advantages of power-matched design, because only Spicer designs and manufactures *complete* 4-wheel drive assemblies for light and medium-duty trucks. The Spicer name on both front and rear driving axles, transfer case, drive shafts and universal joints means maximum power and efficiency.

Specify Spicer for 4-wheel drive units, for maintenance-free performance, and for immediate parts availability—anywhere in the country!

Spicer front drive axles have been job-proven by over a quarter-century of rugged use in both civilian and military vehicles.

Special Spicer rear axle design and construction assure precision alignment of gears and bearings at all speeds and load conditions for quieter operation.



Power-Matched . . . Spicer *complete* four-wheel drive assemblies are designed to work together for dependable, full power traction.

This $1 million contract was one of the initial phases of the $387 million John Day Dam project, which is being built under the direction of the Walla Walla District of the U. S. Army Corps of Engineers. Of this cost, more than $100 million goes for the relocation of 140 miles of railroad and 70 miles of Washington and Oregon state highways.

All of the excavation on Mullen's contract went into one large embankment that will carry the new alignment of the Spokane, Portland & Seattle Railway around the dam. The common excavation made up the core of the embankment, while the rock was used to build a 6-foot-thick facing on both sides.

Rock moves fast

Where the rock was encountered in the spillway excavation, Mullen moved in five Ingersoll-Rand Crawl-IR track-mounted drills, each with its own Ingersoll-Rand 600-cfm compressor. Three-inch holes were punched down approximately 20 feet in an 8 ×8-foot gridiron plan. They were loaded with Atlas Nitro Carbo Nitrate, with a single stick of dynamite for primer in each hole. The shots produced very good fragmentation.

The big Kolman loader was set on the low side of the rock area. This permitted the D9 dozer to move much of the material either downgrade or on the level as it fed the conveyor. The D9 with its U-dozer pushed the rock directly onto the 60-inch belt of the conveyor without the use of any kind of feeder. The 70-foot-long conveyor was powered by a GM diesel engine.

Four Euclid end-dumps hauling from the loader just about kept pace with the D9, but the loader could easily have handled more. The trucks were loaded in about half a minute, but a round trip on the 7,500-foot haul took seven to ten minutes.

In the area adjacent to the rock outcropping, Mullen's Euclid scraper spread made quick work of moving a million yards of common excavation, which was largely sand and gravel. The spread consisted of three TS-24, four SS-24, and two S-18 scrapers with two Cat D9's and a Euclid TC-12 doing the pushing. All of the scrapers were sideboarded for an extra 6 yards of capacity.

In this straightforward high-speed scraper operation, the haul road was a primary factor. The million yards of common and the quarter-million yards of rock excavation all came from a relatively small area—the dam spillway. All of the material went into one large embankment—the railroad fill. The haul road between the two was the magic mile that spelled profit or loss for the job.

Mullen built the road 60 feet wide to accommodate four lanes of traffic. This made it possible for rigs to pass in either or both directions without delay or danger. This was especially important, with the slower end-dumps sharing the haul road with the scrapers. The road's gravel surface was well compacted and was watered continuously to prevent raveling and to hold down the dust. A Cat 12 motor grader maintained the road constantly to remove spilled materials and to keep the surface smooth.

On the embankment, the scrapers spread their loads of dirt in thin courses as they dumped at high speeds. For compaction, a D8 tractor pulled a Hyster grid roller and a Bros 11-wheel wobble-wheel roller in tandem. The grid roller was ballasted to 22 tons. This combination, together with the scrapers and trucks running over the fill, provided adequate compaction. Water was provided by a Euclid water wagon, which got its supply from a Rex 6-inch pump that pumped directly from the river.

The "Euc" end-dumps hauling the rock dumped their loads at the edges of the embankment, where a D8 dozer spread the material and shaped it to form the rock facing of the fill.

Maintenance

Lubrication and equipment maintenance were especially important in this fast-moving operation. The production units worked two 9-hour shifts 5 days a week. The service crews were on a 3-shift basis 6 days a week. This provided one shift per day and one day per week when the mechanics had free access to any or all of the equipment without interfering with the production operations.

Lubrication and daily servicing were handled by five men working during the regular shifts. A fuel and service station was set up beside the haul road, and the rigs were pulled in one at a time during each shift for fuel and lubrication. The dry-type air cleaners were serviced daily between shifts.

Tire service was provided under contract by The General Tire Co., Lewiston, Idaho, which kept a big-tire rig and a man on the job at all times. His work included a daily check of all tires for cuts or bruises and a more thorough weekly check. The tire service rig was a GMC truck with a high monorail carrier over the bed and a Philadelphia hoist to do

(Continued on next page)

Spicer 4-Wheel Drives The Toughest Terrain!

WRITE *Dana for further information on 4-wheel drives. Please describe your application and include load data.*

DANA Spicer

DANA CORPORATION

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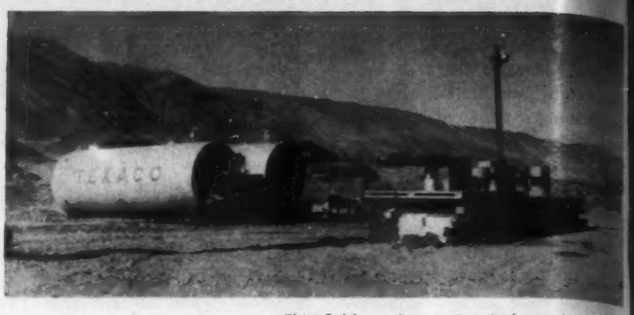
Serving Transportation—Transmissions • Auxiliaries • Universal Joints • Clutches • Propeller Shafts • Power Take-Offs Torque Converters • Axles • Powr-Lok Differentials • Gear Boxes • Forgings • Stampings • Frames • Railway Drives

Many of these products are manufactured in Canada by Hayes Steel Products Limited, Merritton, Ontario

For more facts, use Request Card at page 18 and circle No. 340

Embankment compaction is handled by a Cat D8 tractor pulling a Hyster grid roller, ballasted to weigh 22 tons, and a Broe 11-wheel wobble-wheel roller.



This field service station is located beside the main haul road between the excavation area and the embankment. Scrapers pull in one at a time for Texaco fuels and lubricants.

(Continued from preceding page)

the lifting. A General Supply Co. compressor supplied air for inflating tires and for Chicago Pneumatic wrenches.

To date, most of the work on John Day Dam has been a series of preparatory contracts, the major one being the first-stage cofferdam. This cofferdam has cells 85 feet across, with some of the sheeting as long as 84 feet. These cells rank with the largest ever built. The extremely deep water—up to 70 feet—and the lack of earth cover over the rock created many problems in the construction of the cofferdam.

On-the-job tire service is provided through The General Tire Co., Lewiston, Idaho, which had a big-tire rig and man on the job at all times.

The completed structure will have a crest length more than a mile long, and its power plant will eventually produce more power than Grand Coulee. The spillway, navigation locks, and fish ladder on the Washington side will be among the first stages of the work. The powerhouse and another fish ladder will be located on the Oregon shore.

The general contract for $32,381,096, covering the first stage of construction, was awarded on December 16, 1959, to Montag-Halvorson-McLaughlin & Associates, a Portland, Ore., joint venture. Work is currently under way.

The resident engineer for the Walla Walla District of the Corps on the project is H. B. Elder. Chief of foundation excavations in charge of the Mullen contract was Sam Sargent. District engineer is Col. Paul H. Symbol.

Mullen's supervisory staff was headed by project manager Harry Claterbos and included general superintendent Fred Roberts, project engineer Raymond P. Senior, excavation superintendent Troy Carter, labor foreman Lawrence Junger, and master mechanic Raymond P. Dell.

THE END

MARTIN

Tiltable Patcher

Retractable, tiltable patcher exerts 3½ tons of compaction pressure, automatically adjusts to road contour regardless of position of truck wheels

Here's the perfect road patcher! It is attached under the truck frame and can be lowered to roll a smooth patch any time, anywhere. It produces a smoother patch much faster than hand tamping and eliminates the need for a conventional roller. It doesn't interfere with normal truck operation. Hydraulically exerts 3½ tons of compaction pressure, yet adds only 700 lbs. of weight to the truck. Costs thousands of dollars less than similar capacity conventional roller. It's raised and lowered by an electrically-operated hydraulic pump. Two spring-loaded scraper blades and a built-in sprinkler system keep asphalt from sticking to the roller.

FEATURING EXCLUSIVE TILTING DESIGN

Tiltable patcher pivots at the center to exert a uniform, controlled compaction pressure across the entire rolling surface, regardless of road contour!

progress through Research • Design • Engineering

MARTIN COMPANY

620 Andrews Ave. • Kewanee, Illinois
P.O. Box 187 • Phone 4254 • Cable MARCOMY

For more facts, circle No. 341

CONTINENTAL RED SEALS ARE ENGINEERED TO FIT THE JOB

Rarely will you find an item of industrial, construction or road building equipment that won't run best and cheapest on Continental Red Seal power. The reason lies in specialization—in Continental's long-standing policy of engineering each model precisely to the work to be done. Whatever the machine . . . whatever its job . . . you can bank on it for abundant power at the speeds consistent with low fuel and upkeep cost.

●

Continental's ruggedness and rightness of design are helping to build prestige for more and more of the leading builders of specialized power equipment. It's wise when buying equipment of this type, to choose a make with dependable Red Seal power—power backed by specialized experience dating from 1902.

●

FACTORY-APPROVED PARTS AND SERVICE EVERYWHERE

Continental Motors Corporation
MUSKEGON, MICHIGAN

For more facts, circle No. 342

FUNK Units lend EXTRA performance to this mine buggy

On this Dart Mine Buggy, a compactly-designed FUNK transmission provides multiple speed control and doubles as a drop box, thus saving the cost of a 3-stage gear box or a fixed chain drive.

And a FUNK Revers-O-Matic Drive, equipped with a torque converter, allows the operator to change speed and direction of travel with foot levers — leaving hands free.

It always pays to look for FUNK Modular Power Units on the equipment you buy.

FUNK MFG. CO. BOX 577-B COFFEYVILLE, KANSAS

For more facts, circle No. 343

Control tower opened at Newark Airport

■ A new $1,500,000 ultramodern control tower has been opened by The Port of New York Authority at Newark (N. J.) Airport. The 150-foot-high structure and related installations contain about $1 million worth of federal air-traffic-control electronic equipment, including radio transmitters and receivers, direction finders, and air-surveillance radar.

The tower has a circular ground floor, 78 feet in diameter, which contains Federal Aviation Agency offices and building utilities. A 117-foot concrete shaft rising from the base of the tower encloses an elevator, stairways, and equipment conduits. At the 65-foot level, three 65-foot-wide floors, containing air-traffic-control equipment, are cantilevered out to a 37-foot overhang.

The control tower cab is above the air-traffic-control rooms at the 117-foot level. The area above the cab will accommodate airport surface detection equipment. A 17-foot-diameter globe, a "radome," will be installed to protect radar antennas on the top of the tower.

The 150-foot-high control tower at Newark (N. J.) Airport has a 78-foot-diameter circular ground floor; a 117-foot concrete shaft containing an elevator, stairways, and electrical conduits; three pie-shaped office and equipment floors; and a 20-foot-square control cab. Approximately $1 million worth of air-traffic-control electronic equipment is installed in the tower and related installations.

CWA elects officers

■ The Construction Writers Association, at its annual meeting in late January, elected its 1960 slate of officers. James T. Jenkins, Jr., editor of *American Road Builder*, is the new president, succeeding Edward Wellepp.

Other officers are vice president Henry T. Perez, editor of *Construction Methods and Equipment;* secretary-treasurer Eugene E. Halmos, free-lance Washington correspondent and feature writer for CONTRACTORS AND ENGINEERS.

New directors are Ralph Monson, field editor for CONTRACTORS AND ENGINEERS; Harold J. McKeever, editor of *Roads and Streets;* Arthur Faber, editor of *Construction Equipment News;* and Edward Wellepp, editor of *Kansas Construction Magazine.*

Vermilya-Brown to erect Morgan Library addition

■ Vermilya-Brown Co., Inc., New York City, will construct a 2-story-and-basement wing for the J. P. Morgan Library at 36th Street and Madison Avenue, New York City. The contract includes an elevator in the new wing, air-conditioning equipment for both old and new buildings, and alterations in the exhibition room and central hall.

The contractor marks its 106th anniversary this year.

Parsons appoints

■ T. W. O'Donnell has been appointed district representative for the northeastern United States by Parsons Co., division of Koehring Co., Newton, Iowa. He will have headquarters in Saegertown, Pa.

The Convention Calendar appears on page 85 of this issue.

Portable Lima Austin-Western 101-SE crushing plant spews pit-run stone and gravel into mobile surge bin.

Lima A-W Portable Crushers deliver

RELIABLE HIGH OUTPUT!

Designed and built for high output under *rugged* operating conditions, this portable Lima Austin-Western crushing plant is *ready* to pick up and go on a moment's notice. It belongs to the Williams Brothers Asphalt Paving Company, Ionia, Mich.

Reduced tonnage costs

They say, "It's a reliable high-output mobile rig that's been doing a very dependable job for us in widely separated locations throughout southern Michigan.

"It's not a complicated piece of equipment. Only minimum maintenance has been required. It's easy to adjust to meet a wide range of rigid specifications in pit or quarry work. We find that the outfit's one man, central control also helps us to reduce costs per ton."

The 101-SE is a completely portable, self-contained unit designed and built for rapid transport from job to job. High-speed production of construction materials near the job greatly reduces hauling time and costs.

Maintenance reduced

Diesel power operates crushers and electric generator; all other operations are electric. Simplicity of transmission eliminates troublesome clutches, chains, sprockets and gearboxes . . . reduces maintenance, increases tonnage profits.

There's a portable or stationary Lima Austin-Western crushing and screening plant just right for your needs. Investigate—see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Stationary installation—Lima A-W line includes jaw and roll crushers, matching screens, elevators, conveyors and bins.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

6015

For more facts, use Request Card at page 18 and circle No. 344

Ore trains, and the big shovels that load them, appear as miniature equipment against the stepped sides of the world's largest open-pit copper mines, where surrounding overburden is being removed so that the pit can be widened and deepened. Western Contracting Corp., Sioux City, Iowa, is handling the job in Bingham Canyon, Utah.

World's largest truck paces other equipment . . .

in stripping million yards of rock per month to enlarge huge open-pit copper mine in Utah

The world's largest truck and a fleet of its smaller brothers are moving a million cubic yards of rock overburden per month. The contract covers an 8-million-yard stripping job for one of the world's largest open-pit copper mines.

Western Contracting Corp., Sioux City, Iowa, brought the huge 80-yard "Eucnik" from Oahe Dam in South Dakota to Bingham Canyon, Utah, to assist in the stripping job. This contract is one of a series in the expansion of the huge open-cut copper mine of the Utah Copper Division, Kennecott Copper Corp., at Bingham Canyon.

Although the big truck is the giant of this job, the other rigs on the project would be giants on almost any other job. These include 33 Euclid Model LLD 50-ton end-dumps, two Bucyrus-Erie 50-R drills, two Marion 191-M shovels with 13-yard dippers, five Cat D9 tractor-dozers, and a group of smaller machines.

NEW DESIGN! NEW EFFICIENCY!

Asphalt men designed it. Asphalt men tested it. The new Standard Asphalt Distributor has been field tested for two years on every type and grade of asphalt available, over three million gallons in all.

MODEL 424-56 PRESSURE DISTRIBUTOR

New power, New pump, All new features—as follows: A new "Econo-bar" spray bar in addition to the famous Standard Steel "Miracle" spray bar. New hydraulic spray bar lift. More convenient, easier to operate controls. Shorter, simplified piping to reduce heat bleed-off.

The Model 424-56 is built in 1000, 1250 and 1500 gallon capacities as standard and can be furnished in other capacities, either truck or semi-trailer mounted.

Write for Catalog #RS1256 or see your dealer.

OTHER PRODUCTS OF STANDARD STEEL

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Built to the Highest Standard

Standard Steel Works, Inc. NORTH KANSAS CITY, MO. PD-151

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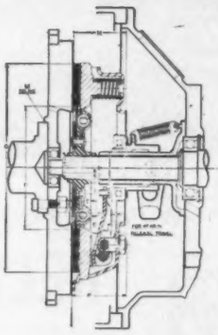
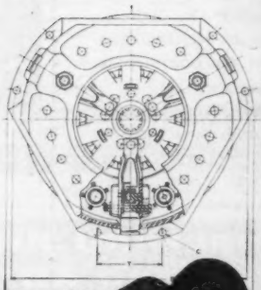
ROCKFORD





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Heavy Duty Spring Loaded

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Power Take-Offs

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Precision Built for Better QUALITY

ROCKFORD Precise Workmanship provides clutch levers that reduce friction, improve release action and prevent lever throw-out. These wear-resisting, life-lengthening clutch features are covered by patents and are essential to designs that must be projected with a thought to uses of tomorrow. ROCKFORD engineers now are working with many companies on their future designs —to provide custom-engineered clutches for long range economy. Their services are available to you at your convenience.

SEND FOR THIS HANDY BULLETIN Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER

314 Catherine St., Rockford, Ill., U.S.A.

Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

For more facts, use Request Card at page 18 and circle No. 346

The giant of the spread, this "Eucnik" is loaded with overburden by a Marion 191-M 13-yard shovel in seven passes. The semitrailer rig, riding on 18 tires on 5 axles, has a struck capacity of 80 cubic yards. Built by the contractor, it weighs 78½ tons empty and about 200 tons loaded.

In Western's typical big operation, even these large machines had to be made bigger. The masts of the 50-R drills were lengthened 12 feet so that the rigs could drill 45-foot holes without adding steel. Larger compressors and electric motors were installed to compensate for the high altitude and to speed the drilling. Blades on the D9 dozers and on the Gallon T-700 motor graders were lengthened to 18 feet so that they could clear a road for the trucks in a single pass. In short, the operation was geared to match the big haul units.

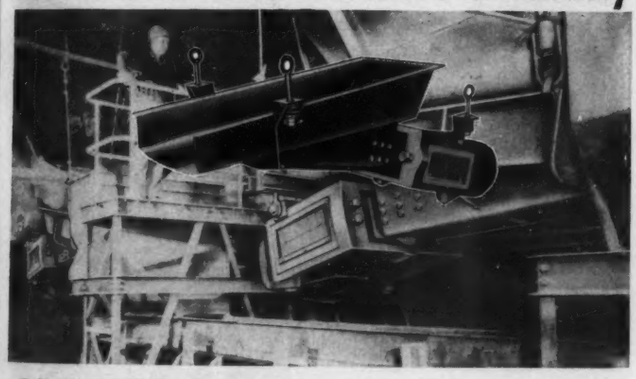
Remove rock mountaintops

In simple terms, the contract calls for the removal of mountaintops on the east and west sides of the huge bowl-shaped mine. This stripping of the rock overburden exposes additional areas of the ore body and also permits the widening and subsequent

(Continued on next page)

SYNTRON cost-reducing equipment of proven dependability

moves bulk materials more efficiently



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VIBRATORY FEEDERS

—increase the operation efficiency of today's modern concrete plant, by more efficient, dependable material handling.

—by instant finger-tip control. The vibration of these feeders is instantly controllable providing a smooth, even flow of material to match operational capacities.

—by simplicity of design. Their powerful electro-magnetic drive is designed to give long, dependable, trouble-free service with very little maintenance.

SYNTRON Vibratory Feeders are available in a wide range of sizes, tonnage capacities and trough styles to meet every need.

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Other SYNTRON equipment of proven dependable quality

ELECTRIC SAWS

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CONCRETE VIBRATORS

For more facts, use Request Card at page 18 and circle No. 347

NEW Coffing SEALED Safety Pull Ratchet Lever Hoist

Five Seals Assure Efficient Hoisting In Any Weather

Here is a new hoist designed for safe, efficient hoisting in any weather. Loads will not slip because the brake mechanism of the Safety Pull Hoist is permanently sealed in five places against moisture, oils, chemicals and dirt—all common causes of hoist slippage.

The spring-loaded Neoprene seals assure that brake performance will remain constant under all exposure conditions. Another advantage of the sealed brake is that it will not freeze or lock—is always free to lower even after accidental overload.

Safety features include the exclusive Safety Handle which bends to indicate overload. The free chain control is protected so that it will not accidentally trip.

The Safety Pull Hoist is easy to operate. The handle pull to lift rated load requires minimum effort. Load spotting is precise to within a fraction of an inch. Up and down controls are away from operator's hand so he can use shorter leverage for greater speed with light loads. Ball bearing swivel load hook and plated chain are additional features.

Five models, ¾, 1½, 3, 4½ and 6-ton capacities are available. For additional information ask your distributor or write for Bulletin ADH-78.

COFFING HOIST

DIVISION OF

DUFF-NORTON COMPANY

810 Walter Street • Danville, Illinois

COFFING HOISTS
Ratchet Lever • Air
Hand Chain • Electric

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DUFF-NORTON JACKS
Ratchet • Screw
Hydraulic • Worm Gear

For more facts, use Request Card at page 18 and circle No. 348

The big hauler dumps an 80-yard load in the disposal area. The 13½-foot 3-stage telescoping hydraulic hoist requires 640 gallons of hoist fluid per minute to raise the box to a height of 45 feet for the dump. Western developed the pumping system by putting four large conventional systems in parallel.

(*Continued from preceding page*)

deepening of the mine.

Practically all the operations are conducted in the range of 7,400 to 7,800 feet above sea level.

As the material is excavated, it is hauled out on practically level roads built on benches around the adjacent mountains to the disposal areas. This method has been used for the disposal of waste and overburden throughout the excavation of the mine, and now, adjacent mountainsides are a series of terraces built up of the waste material.

Since the excavations on the two sides of the mine were not connected, Western supervisors chose to conduct them as two separate operations. Each side has its own spread of equipment, and its own supervision. Each also has its own maintenance and repair facilities (see page 78). Project manager T. E. "Tom" Speight provides the over-all administration and correlates the activities of the two spreads.

Takes three flatcars

Moving in this big spread was a project in itself. Most of the machines came by rail from other job locations, although some new rigs came directly from the factories.

The "Eucnik" was delivered by three flatcars. The dump box made one carload, the rear drive and tandem axles another, and the truck frame and engines with axles removed made up the third. The cars carrying this truck, the 191-M shovels and the 50-R drills were brought in through the mine on Kennecott's railroad and shuttled through a series of switchbacks up to one of the highest levels of the mine.

Here, an American 150-ton stiffleg derrick unloaded the components from the cars and reassembled them. A Bucyrus-Erie Hydrocrane assisted on the lighter lifts. Even the big 191-M shovels were reassembled in only four days. The machines traveled on their own power from the unloading point to the work areas.

The Euclid LLD's and many of the smaller machines were unloaded from the rail cars at the village of Lark, which is at the foot of the mountain on the opposite side from the mine. These rigs were driven some 5 miles over a steep winding road to the top of the mountain. Drivers taking one of these big trucks up the steep mountainside on a road not quite as wide as the truck had some real thrills. But all the rigs made the trip without incident, in spite of the fact that there was snow and ice on some portions of the road.

By the end of December, 1958, most of the equipment was on the site, and the job really got under way at that time. The first snow came in October, but it did not appreciably delay the work. In addition to the dozers and motor graders, the contractor has a Snogo rotary plow on the job. Snow removal was easily handled, and the crew lost only about five days all winter because of the snow and cold.

Rebuild roads

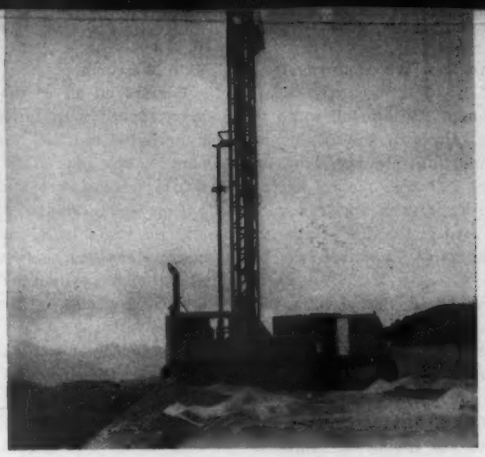
Western's first operation was to rebuild the haul roads. The old roads used by a previous stripping contrac-

<footer>130</footer>

USS TIGER BRAND—AMERICA'S NO. 1 WIRE ROPE

607,000 cubic yards of concrete delivered

SUTTON DAM—One of the largest flood control dams in eastern United States, located on the Elk River about 80 miles from Charleston, West Virginia. Designed and built under the direction of U.S. Army Corps of Engineers, Huntington, West Virginia. Contractors: Joint venture [illegible] Arundel, Dixon-Hunkin. General Superintendent for contractors, Jay Hay; Project Engineer, Ed. Hahn.



This is one of the Bucyrus-Erie electric-powered 50-R drills used to sink 12¼-inch blast holes in the rock overburden. The drills use Hughes Tricone WR7 bits in putting down holes on a 25 to 30-foot gridiron spacing. To drill for the 35-foot benches, Western modified the drills by extending the masts 12 feet and installing larger compressors and electric motors than were originally supplied.

tor, were only 30 feet wide in places, had little or no superelevation on the curves, and were generally unsafe for high-speed operation of big equipment. The main roads were rebuilt to a minimum width of 60 feet, with all of the curves superelevated for 35-mph speeds.

Two Eimco 105 loaders picked fine rock from selected pockets for the base and surfacing of the roads. The five Gallon T-700 and two Cat 12 motor graders built and maintained the surfaces. Water was applied as needed, for compaction and to hold down the dust, by a Euclid 6,000-gallon water wagon and a 4×4 International carrying a 2,000-gallon tank.

To minimize tire damage, the contractor keeps men on the roads to pick off the large and sharp pieces of rock which fall off the trucks along the way.

Given the alternative of excavating in 70 or 35-foot benches, the contractor chose the latter. The 50-R drills, using 12¼-inch Hughes Tri-Cone WR7 bits, punch out the blast holes on a 25 or 30-foot gridiron pattern to a depth of 45 feet through the quartzite and limestone rock. These drills and the shovels are powered with electric motors supplied from Kennecott's power lines. These lines run throughout the mine to supply the mining equipment.

The holes are loaded with ammonium nitrate with a 2-pound charge of Hercules dynamite at the bottom of each hole. The uncoated ammonium nitrate supplied, by Spencer Chemical Co., Kansas City, Mo., is primed with 6 per cent of diesel fuel. As the explosives are delivered to the job, a ¾-inch pointed nozzle is jabbed into the polyethylene bag and the required amount of fuel oil is pumped in. The bags are then stored a minimum of 72 hours before use to permit dispersion of the fuel.

The ammonium nitrate is poured into the holes through a 3-foot length of Sonotube, and the top of the hole is backfilled with drill cuttings. Explosive requirements are about half a pound per cubic yard of quartzite rock and about 0.8 to 0.9 pound per cubic yard of limestone. Fragmentation is very good, and no secondary drilling is required.

The haul units are loaded fast by the big 13-yard Marion 191-M shovels. Three scoops of the dipper put a heaping load on one of the Euclid 50-ton LLD's in about 55 seconds. The big truck took seven passes. On a 2½-mile haul, which is longer than average, ten of the LLD's and the big rig kept one of the 191-M shovels busy. Fewer haul units are needed for the shorter hauls.

Big truck a real giant

This job gives the "Eucnik" a real chance to show its worth. While its builders admit that it is underpowered with its two 375-hp Cummins diesel engines, this factor is not critical on this location because the haul roads are practically level. The big truck takes more than twice the load of the Euclid LLD's and makes the round trip to the dump almost as fast.

This huge truck is really a semi-trailer rig carried on 18 tires (18.00 × 33 size) mounted on five axles. It is 14 feet high with the box down, but the box rises to a height of 45

←For more facts, circle No. 349

ir express" on (USS) Tiger Brand Tramway Cable

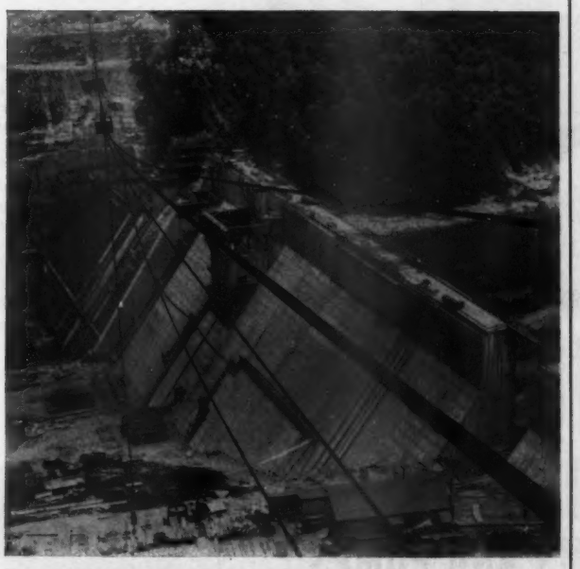
Every 3½ minutes this cableway bucket pours another load of "mud" into the mammoth Sutton Dam near Charleston, West Virginia. They're pouring at the rate of 9,000 cubic yards a week—fast time for one 8-yard bucket. When finished, the dam will contain about 607,000 cubic yards of concrete.

The main "gut" is a Tiger Brand 3-inch Locked Coil Tramway Cable 1,700 feet long. It stretches between one fixed tower and one *moveable* tower so that the bucket can reach any part of the dam. This cable was bought new for the job and from all indications will still be serviceable when the dam is completed. Other Tiger Brand Locked Coil Cables have been used on two or more big dams before replacement was necessary.

All over this project, Tiger Brand Wire Rope is doing a stupendous job. On one of the more critical applications, a 3,920-foot endless rope is used to pull the carriage assembly. Because of the hard wear this particular rope must take, they used a 1⅛" 6 x 30 flattened strand rope made of tough Monitor Improved Plow Steel.

Tiger Brand Wire Rope was also used for the hoist line, button line and take-up line, largely because of its excellent performance on previous dams such as Mt. Morris and Shasta. Mr. Lamar Pearce, Cableway Superintendent, who has had a world of experience on big dams, uses Tiger Brand more than any other make. For more information on wire rope, write American Steel & Wire, Dept. 0140, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks



Main Gut—USS Tiger Brand 3-inch Locked Coil Cable with smooth surface for efficient operation. Interlocked construction holds each wire in its proper position.

Lamar Pearce, Cableway Superintendent, who knows from experience that Tiger Brand Wire Rope is safe and dependable.

Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete research and manufacturing facilities in the steel industry.
2. It is designed by one of the country's most capable staffs of wire rope engineers. It is serviced by thoroughly experienced field representatives always ready with their assistance.
3. Every type of Tiger Brand Wire Rope is designed for specific applications. *You* get the *right* rope for the job.
4. It is made by *one* company, U.S. Steel, and every step of production from ore to finished product is carefully controlled and supervised to guarantee *one* high standard of quality.
5. Tiger Brand Wire Rope is manufactured by the foremost single wire rope producer in the country.

Concrete delivered by aerial cableway—the cheapest and fastest way to haul materials needed for the dam.

(USS) **American Steel & Wire Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad

(Continued from preceding page)

feet to dump. The over-all width is 15½ feet. Although the weight of the box and frame are minimized by the use of T-1 steel, the rig weighs 78½ tons empty and approximately 200 tons loaded. Its struck capacity is 80 cubic yards. Rated speed is 35 mph.

The hydraulic hoist that raises the huge box presented some problems that were solved in Western's shops. The 3-stage double-acting telescoping hydraulic hoist extends to a length of 13½ feet. It requires the delivery of 640 gallons of hydraulic fluid per minute. To accomplish this, four of the largest available hydraulic systems were mounted in parallel. The load can be dumped in 15 to 18 seconds.

Engines on all of the haul units are equipped with turbochargers to compensate for the loss in horsepower at this high altitude. Even the pickups and service trucks for the job are equipped with special high-altitude conversions, including special pistons and carburetors. Four of the pickups used by supervisors are International A-120 models with 4-wheel drive.

The job of moving the drills and shovels up the steep ramps from one bench to the other causes some concern. With the aid of D9 tractors both ahead and behind, the heavy rigs are moved up ramps with as much as an 18 per cent grade.

The contractor found an abundance of good, experienced workmen who make it possible to operate the job on a 2-shift basis 6 days a week. With production at 2,000 cubic yards per hour, this meant that 240,000 yards of rock is being moved per week, or nearly a million yards per month.

Western Contracting Corp.'s supervisory staff is headed by project manager T. E. "Tom" Speight. Others on the staff are project engineer R. C. Miesen, project accountant T. W. Lowe, general foreman A. P. "Swede" Miller, haul superintendent Glen Estes, and master mechanic Ray Nicholson.

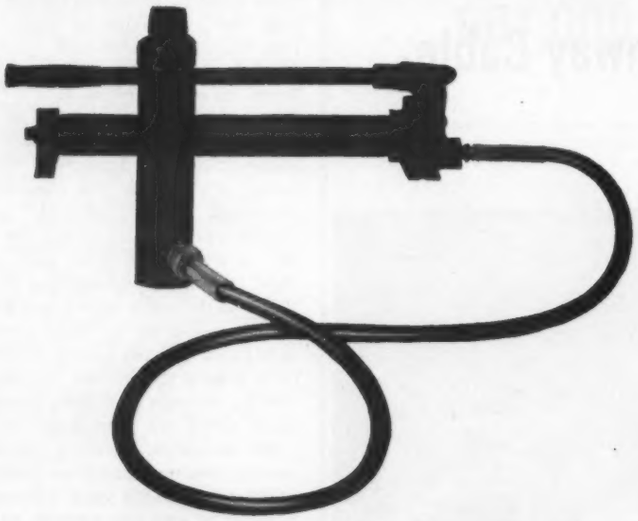
The job offices are housed in a 10×50-foot Whitley office trailer that makes a very comfortable, convenient, and efficient setup. Payrolls for the 175-man crew, equipment records and the purchasing of supplies are handled through the field office.

The work is being done for the Utah Copper Division of Kennecott Copper Corp., under the direct supervision of mine engineer A. J. McKeller. The chief engineer for the mining company is A. J. Thull, with offices in Salt Lake City. Tim Ry

Clark Equipment names

■ William M. Cramer has been appointed a district representative for the Michigan line of construction and bulk - material - handling equipment produced by the Construction Machinery Division, Clark Equipment Co., Benton Harbor, Mich. He will cover upper New York State and New England.

VERSATILE POWER PACKAGE



DUFF-NORTON RAM-PAC®
HYDRAULIC RAMS AND PUMPS

The Duff-Norton Ram-Pac line provides a versatile source of power to apply from 10 to 100 tons of force in any direction—with little effort.

The twelve rams may be used with the hand or power pumps as portable sources of power for adjusting, testing, bending—pulling gears, sleeves and cylinder linings—pushing pipe or culvert—for heavy moving and lifting. They also are used for permanent installation in hydraulic jigs, fixtures and presses.

The five pumps include two hand pumps, an air-hydraulic pump, an electric pump and a gasoline powered pump. Attachment units, accessories and fittings further increase the versatility of the line. For description and specifications ask your distributor or write for Bulletin AD-90S.

DUFF-NORTON JACKS

P. O. Box 1889 • Pittsburgh 30, Pennsylvania

COFFING HOIST DIVISION • Danville, Illinois

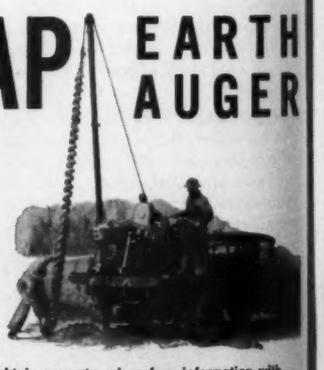
DUFF-NORTON JACKS
Ratchet • Screw
Hydraulic • Worm Gear

COFFING HOISTS
Ratchet Lever • Air
Hand Chain • Electric

For more facts, use Request Card at page 18 and circle No. 350

A CRANE REQUIRING AIRCRAFT WARNING LIGHTS, because it's as tall as a 20-story building, serves Great Lakes shipping on the St. Lawrence Seaway. Weighing 325 tons, it moves along a specially constructed 2,000-foot-long railroad track. The crane features its own diesel electric power plant; a 140-foot boom that can lift a maximum of 55 tons; and a 12-foot jib with a 5-ton lifting capacity. The crane was designed, built, and erected in less than a year by Provincial Engineering, Ltd., Niagara Falls, a subsidiary of Houdaille Industries, Buffalo, N. Y.

ACKER AP EARTH AUGER



The world's most versatile soil sampling rig

- Soil Sampling
- Penetration Tests
- Drive Sampling
- Diamond Bit and Shot Core Sampling
- Developing Rock Profiles
- Permeability Tests
- Locating Borrow Pits
- Plotting Water and Sewer Main routes

dozens of other applications

You can obtain accurate sub-surface information with the remarkably versatile Acker Earth Auger. Its design and built-in features permit speedy earth sampling with either large diameter single flight or continuous flight augers. The patented hydraulic head permits pressing samples or coring with diamond or inexpensive shot core bits. A rugged built-in hoist is handy for driving casing, doing standard penetration tests, or hoisting operations.

Whatever your soil sampling requirements may be, chances are, that this inexpensive, portable earth auger will do it better! You'll be surprised at the capacity and price of this incomparable rig!

Write today for Bulletin 40-R or 16mm sound movie on loan basis.

ACKER DRILL CO., Inc. P.O. BOX 830 SCRANTON 2, PA.

Over 40 years of experience manufacturing a complete line of diamond and shot core drills, accessories and equipment.

For more facts, use Request Card at page 18 and circle No. 351

PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.

Prime mover features trucklike speed plus tractorlike high-torque power

The Ottawa Steel Division of the Young Spring & Wire Corp. announces a 9,200-pound prime mover designated the Commando.

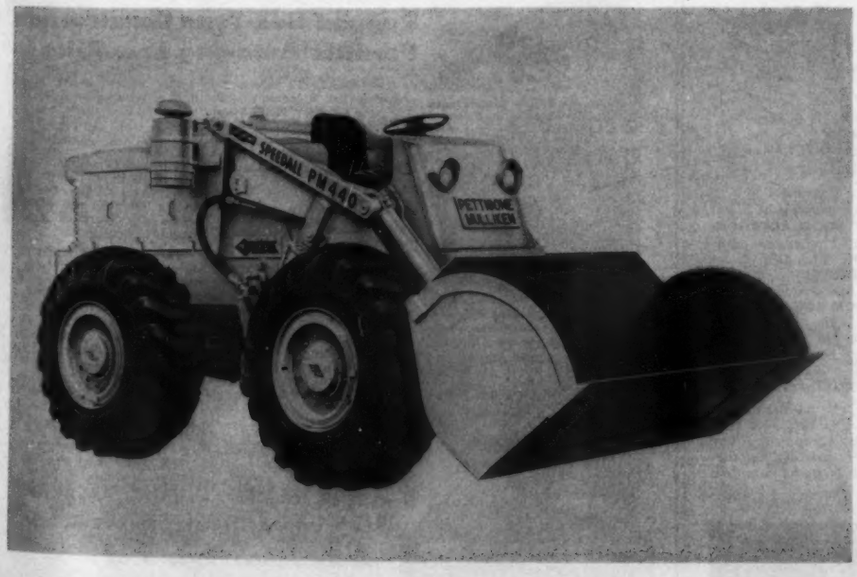
One of the major features of the new machine is its shuttle transmission—a split torque drive arrangement that permits full-power hydraulic creep, solid direct-drive, or torque-converter drive.

The Commando turns in a 24-inch circle. It is available in 2 or 4-wheel drive. Speeds range from a controlled creep at full throttle from 0 mph up to 35 mph.

Steering, shifting, and controls for the firm's Uni-Tool attachments are handled by hydraulic power.

Available in a wide variety, these attachments can be used singly or in combination. When mounted, each tool becomes a completely self-contained, self-propelled unit.

Write to the Young Spring & Wire Corp., Ottawa Steel Division, Dept. C&E, 435 S. Main, Ottawa, Kans., or use the Request Card at page 18. Circle No. 110.



Rubber-tire tractor shovel has 10½-ton lifting capacity

A new 11,000-pound-capacity rubber-tire tractor shovel has been introduced by the Pettibone Mulliken Corp.

Designated Speedall Model PM-440, the machine has a lifting capacity of 21,000 pounds and a breakout force of 24,800 pounds.

Four buckets are furnished in SAE heaped capacities up to 4¼ cubic yards.

Bucket rollback at ground level is 40 degrees. Clearance under the bucket hinge pin is 11 feet 10 inches. Reach from the front tires to the bucket lip is 3 feet at the maximum dumping height of 9 feet.

Power is supplied by either a GM 152-hp diesel or a Cummins 175-hp diesel engine.

Write to the Pettibone Mulliken Corp., Dept. C&E, 4700 W. Division St., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 27.

Offer signaling decoder for mobile 2-way radios

Motorola announces a transistorized Quik Call selective signaling decoder for use with the firm's mobile 2-way radios, including the recently developed transistorized Motrac radio.

The selective calling system enables a radio dispatcher to alert and talk to individual mobile units in his network without bothering other vehicle operators. When transmitting to a single mobile, the dispatcher presses a button on his Quik Call control console to activate and transmit a preset series of tone signals. These signals are received by all mobile units and fed to the Quik Call decoders. The decoder in the desired mobile activates its receiver's audio circuitry upon receipt of the tone code. All others remain inactive.

If the operator is working away from his vehicle, the Quik Call decoder can be connected to the truck horn or a light to signal the driver that he is wanted on the radio.

For further information write to Motorola, Inc., Communications and Industrial Electronics Division, Dept. C&E, 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 35.

High dumping reach and optimum machine balance are features of the Cat No. 944 wheel Traxcavator. Here, the machine holds a load at full lift height of 12 feet, while moving to dump into a haul unit.

New wheel-loader line announced by Caterpillar

The Cat No. 944 Traxcavator, first of a new line of wheel loaders, is announced by the Caterpillar Tractor Co.

A major feature of this machine is the locating of all lift arms and hydraulic cylinders ahead of the operator's compartment.

Powered by either a gasoline or diesel engine, the No. 944 is fitted with a 2-cubic-yard-capacity bucket as standard equipment. Both the gasoline and diesel engines are rated at 105 net horsepower. The maximum rating of the D330 diesel engine used is 135 horsepower.

High productive ability of the new unit results from the combination of power-shift transmission, which permits split-second shifting into forward or reverse gear; a high-capacity hydraulic system that delivers full

SILENT HOIST
sets the pace again...

360° BOOM SWING—*Now . . . another addition to the famous family of Silent Hoist* **KRANE KAR** *. . . the original Mobile Swing Boom Crane!* **BOOM ROTATION:** *All-Hydraulic 360° continual rotation on heavy-duty double-race ball-bearing turntable.* **BOOM:** *15/22 ft., manual or hydraulic telescoping.* **TRANSMISSION:** *Hydraulic power shift directional in combination with flywheel torque converter.* **STEERING:** *Full time power steering, finger-tip control.* **ENGINE:** *Heavy duty 6 cylinder valve-in head type.* **BOOM TOPPING:** *Horizontal to highest vertical in only 8 seconds.* **BOOM HOISTING:** *Load block 3 parts of line 25 to 55 fpm.* **TIRES:** *Dual pneumatic tires on traction axle for high flotation and extra blow-out protection.* **TOTAL VISION AND SAFETY:** *No obstruction in any position of load or crane; operator fully protected through 360° rotation of boom. Write for complete details in illustrated bulletin 899.*

180° BOOM SWING—*The Standard widely favored All-Hydraulic or Mechanical 180° swing boom crane models. Lifts, carries, and places any load up to 12½ tons. One engine powers the machine for travel and all crane applications—finger-tip control. Front traction wheel drive supports chassis and crane load. 2 geared speeds for hoisting, topping, and swinging. No tail swing—Boom never passes over Operator's head. Write for complete details in illustrated bulletin 879.*

SILENT HOIST & CRANE CO.
BROOKLYN 20, N. Y.

For more facts, use Request Card at page 18 and circle No. 352

Model 202, 40' x 24", 6' x 36" Model 5B-60 Screen, Model VH-4, 17 to 30 HP Wisconsin gasoline air-cooled engine, attached Reciprocating Plate Feeder, Hopper and roof type grizzly bars.

Single-deck vibrating screen folds into towing position without dismounting screen or any of the drive assembly.

Rugged construction of Model 202 permits use of double-deck KOLMAN screen to make several sizes of material at once.

Sturdy design of Model 202 permits installation of loading trap on tail section, portable without disassembly.

Rugged Box-Type Construction Permits Amazing Low Price

The Model 202 meets the demand for a conveyor in the low price field stout enough to carry a large single or double-deck vibrating screen and loading trap in a completely portable conveyor-screen plant.

"Box-Type" Construction

The rugged "box-type" construction of the Model 202 conveyor gives it unusual strength and rigidity. The sides are fabricated of 3/16" steel plate formed into a channel 16" deep with 2" legs. The steel belt cover reaches completely across the top, completing the box and completely encasing the return belt to prevent materials from working in to cause belt damage.

The under - slung power unit provides easy access for servicing and operation.

Folding Feature

The 202 is available with the Head Pulley Clutch feature which allows the belt to be stopped and started while the vibrating screen remains in operation.

The KOLMAN Model 202 is rugged enough to carry a loading trap and large vibrating screen without additional support. It will take the kind of punishment that is dished out in a portable outfit—and will cost you far less money to own and operate. Available in 18" or 24" belt width, in lengths up to 50'.

For Further Information Write or Wire

KOLMAN MANUFACTURING COMPANY
4922 West Twelfth St., Sioux Falls, S. D.

For more facts, use Request Card at page 18 and circle No. 353

hydraulic power during critical loading phases; and a high degree of machine stability in all conditions.

Dumping reach of the No. 944 totals 31.75 inches at maximum height. The maximum dumping height is 9 feet 1.87 inches.

The bucket is provided with a tip-back angle of 41 degrees at ground level. Tip-back at maximum lift is 50 degrees.

An automatic bucket positioner and lift kickout, operated hydraulically, are standard equipment.

The No. 944 is designed with sufficient power always available to operate the bucket at full hydraulic power while maneuvering the machine. The power train includes a power-shift transmission, which is a 2-speed forward, 2-speed reverse planetary transmission. It also provides a manually shifted range-selector transmission, which provides the machine with a 4-wheel-drive work range or a 2-wheel-drive travel range. The transmission is geared to provide 25 per cent faster travel speed in reverse.

Easily accessible operating controls are an important feature, as well as an over-all design that permits easy servicing.

Available attachments include a side-dump bucket with a capacity of 2 cubic yards; a light-material bucket with 3-cubic-yard capacity; and a 2-yard quarry bucket.

Scheduled for availability later this spring are two other wheeled Traxcavators, one with a standard bucket capacity of 1.25 cubic yards, the other with a 2.75-cubic-yard bucket capacity. All three machines have similar configuration and machine design features.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 111.

Leather pocket case for slide rule, pen, pencil

Remco Products has available a new, lightweight leather pocket case designed to hold an engineer's slide rule, pen, and pencil firmly in shirt or coat pocket. A compartment in the back holds a note pad or letters.

The large steel clip is encased in leather to protect shirt pockets.

For further information write to Remco Products, Dept. C&E, 1641 South Ave., Rochester 20, N. Y., or use card at page 18. Circle No. 37.

Air-driven chisel is versatile tool

Albertson & Co., Inc., has available a new air-driven chisel known as the Sioux Slugger.

The tool's uses include shearing metal, cutting and driving rivets, breaking welds, and pulling pins. Design features include a one-piece barrel without parts to become misaligned or worn and a cast-iron handle to withstand long, rough use. Use of this air-driven metal-working tool does not create a fire or explosion hazard, states the manufacturer.

A kit including seven attachments in a metal case is also available.

For further information write to Albertson & Co., Inc., Dept. C&E, 3100 Lowell Ave., Sioux City 2, Iowa, or use the Request Card at page 18. Circle No. 25.

White L-20 ASPHALT PLANT

SAVE $2.00 A TON

Make your own hot mix asphalt with this new WHITE plant and save about $2.00 a ton. At its capacity of 240 tons a day, that's savings of $480.00 a day. Thirty-one of those days pay for the L-20!

Produces any type mix you can get from a $100,000 plant: AC, RC, MC, SC and emulsified for top course, base course, one course, or patch. Two men operate. Capacity is rated at a hot 315 degrees.

Available either portable or stationary, the L-20 will supply black-top for suburban streets, driveways, parking lots, school yards, or state highway maintenance. See nearest White distributor or mail coupon.

TAR KETTLES

TROWELERS

VIBRATORS

Manufacturers of quality construction equipment since 1925.

MAIL COUPON FOR FREE LITERATURE

White Manufacturing Company, Elkhart 9, Indiana

Please send literature on L-20 Asphalt Plant.

name

address

city state

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☐ TROWELERS

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☐ TAR KETTLES

☐ Dealers: Check here for franchise availability in your area.

For more facts, use coupon or Request Card at page 18 and circle No. 355

TRANSPORT TRAILERS DELIVER

THE QUALITY LINE OF DEPENDABLE TRAILERS FOR EVERY HAULING NEED!

MODEL XTT

Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.

MODEL PTX

Heavy-duty tandem axle with adjustable bolsters. Telescopes from 16' to 30' from tractor.

MODEL PX

Heavy-duty tandem axle, spring mounted platform or float.

MODEL GPX

Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.

MODEL KS-F

Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.

MODEL GXTT

Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

MODEL MSO-D

Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.

MODEL T-8-18

14 or 18 foot length between the wheel tilt trailer. 8-10 ton capacity.

MODEL GTX

Triple axle, 6 dual wheels. Capacities 25 through 45 tons. Flat or drop deck.

MODEL KSO-D

Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.

MODEL GPR

Removable gooseneck. Tandem, triple or trunnion axles. Flat or drop decks, or as beam trailers.

MODEL TT

Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.

MODEL PX-O

Heavy-duty, self-loading tandem axle oil field float.

"Transportation Engineering A Specialty"

TRANSPORT TRAILERS INC.

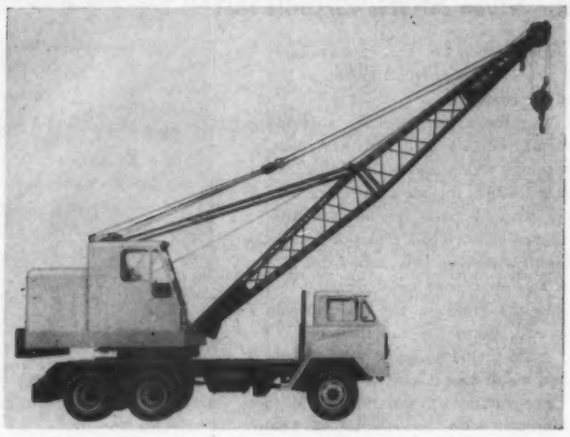
CEDAR RAPIDS IOWA, U.S.A.

EXPORT OFFICE: AMROCTA COMPANY 50 Church St., New York 7, N.Y.

Send Today FREE!

NEW catalog showing COMPLETE line for your transportation needs.

For more facts, use Request Card at page 18 and circle No. 354



This Quick-Way Model 180B is one of eight new models ranging from 8½-ton (⅜-yard) to 25-ton (1-yard) capacity.

New carrier-mounted cranes and shovels

The "Quick-Way" Truck Shovel Co. announces eight new carrier-mounted cranes and shovels, with a wide assortment of front-end attachments.

The machines are offered in three family groups—12½, 10, and 8½-ton capacities in the first group; 20, 18, and 15-ton in the second; and 25 and 22½-ton in the third.

Improvements include new full-vision cab, controls with under-floor mounting, more accessible machinery housing, heavier frame, larger segment-type clutches and brakes, and bolt-on cast counterweight.

A feature of the new line is the method used to develop specific ratings for each model. With the exception of carriers, engines, counterweights, and variations in application of single or tandem-hook rollers, with or without antifriction bearings, all models in each family group have the same heavy-duty upper works as used in the highest-rated capacity of the group.

Either 6×4 or 6×6 drive may be used, according to the job requirements. Heavy-duty frames, axles, and transmissions are used throughout. In addition, a full range of optional carrier equipment is available, including power steering, remote control, optional engines, tires, fenders, and outriggers.

For further information write to the "Quick-Way" Truck Shovel Co., Dept. C&E, P. O. Box 1800, Denver, Colo., or use the Request Card at page 18. Circle No. 93.

New line of diamond bits for heavy-duty drilling

A new line of tubular thin-wall diamond bits for drilling through materials such as reinforced concrete with speed and ease is announced by J. K. Smit & Sons, Inc.

The bits are made in standard diameters from 1/14 inch to 14 inches, and 4½, 12, and 18-inch core lengths. Larger diameters and core lengths are made to individual specifications. Adapters are supplied on bits in diameters to 6¼ inches.

For further information write to J. K. Smit & Sons, Inc., Dept. C&E, Murray Hill, N. J., or use the Request Card at page 18. Circle No. 96.

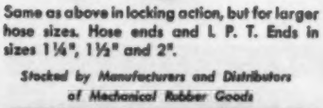
"AIR KING"

FOR *Quick, Pressure-Proof Connections* ON AIR HOSE AND COMPRESSORS . . .

"Air King" Quick-Acting, Universal Type Coupling. Built on plain, rugged lines to assure long trouble-free service under all conditions. Locking heads identical for all sizes of hose or threaded ends within the "Air King" size range. To connect, press together and apply quarter-turn. Reverse to disconnect. Equipped with auxiliary locking device for added safety. Regularly furnished in bronze or rust-proofed malleable iron, but also available in special metals.

Made in Hose Ends and Male and Female I. P. T. Ends, in sizes up to 1".

FOUR-LUG STYLE



Same as above in locking action, but for larger hose sizes. Hose ends and I. P. T. Ends in sizes 1¼", 1½" and 2".

Stocked by Manufacturers and Distributors of Mechanical Rubber Goods

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.

For more facts, circle No. 356

Accurate...Dependable...Economical
PLUS PAYLOAD BONUS!

Look at these capacities! When an Etnyre FX-500 distributor is mounted on a tilt cab chassis:

1500 gal to meet 18,000 lb axle limit
1760 gal to meet 20,000 lb axle limit
2100 gal to meet 22,400 lb axle limit

Similar increased maximums on semi-trailers and tandem axle mountings. And dependable operation . . . uniform, accurate distribution are typical of the results you can always expect from an Etnyre. No-streak spraying with clean, sharp edges is insured by Etnyre's exclusive triple-lap nozzle coverage.

Other FX-500 Quality Features:

- Hardened aluminum jacketing over 2" Fiberglas insulation which is reinforced with molded asbestos blocks.
- Stainless steel jacket near burners and exhaust stacks.
- Stainless steel pump heat jacket.
- Aluminum fenders and mud flaps.

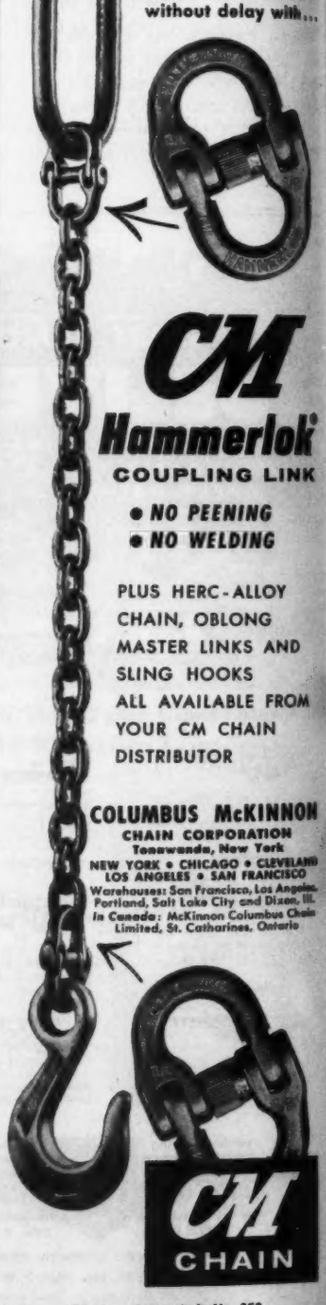
You're familiar with Etnyre's accuracy and dependability . . . now you can get maximum payload too . . . for maximum profit. Investigate today — find out how a "Black-Topper" can handle more work, faster, better, more economically. Write E. D. Etnyre & Co., Oregon, Illinois.

SEE YOUR ETNYRE DEALER

ETNYRE
BITUMINOUS DISTRIBUTORS

For more facts, use Request Card at page 18 and circle No. 357

MAKE YOUR OWN
HERC-ALLOY
CHAIN ASSEMBLIES
without delay with...



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Hammerlok
COUPLING LINK

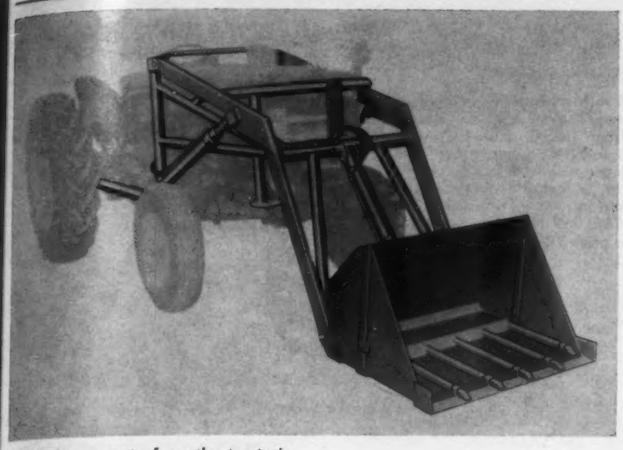
- *NO PEENING*
- *NO WELDING*

PLUS HERC-ALLOY CHAIN, OBLONG MASTER LINKS AND SLING HOOKS ALL AVAILABLE FROM YOUR CM CHAIN DISTRIBUTOR

COLUMBUS McKINNON
CHAIN CORPORATION
Tonawanda, New York
NEW YORK • CHICAGO • CLEVELAND
LOS ANGELES • SAN FRANCISCO
Warehouses: San Francisco, Los Angeles, Portland, Salt Lake City and Dixon, Ill.
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

CM CHAIN

For more facts, circle No. 358



Designed to operate from the tractor's own hydraulic system, the Freeman loader fits a variety of International tractors.

Loader uses tractor's own hydraulic system

A new heavy-duty loader for International tractors, designed to operate from the tractor's own hydraulic system, is announced by the Freeman Loader Corp.

The down-pressure lift cylinders have hard chrome-plated shafts, and all packings are interchangeable. The main frame is of tubular construction, made in two pieces for easy installation and removal. Loader arms are 1×4-inch high-carbon steel, and they accommodate a choice of three buckets: 40-inch combination with plate; 40-inch material; and 66-inch material.

Designated Model 725-A, it reportedly lifts over 1,500 pounds 10 feet (to bottom of the bucket).

For further information write to the Freeman Loader Corp., Dept. C&E, Blair Pike Road, Peru, Ind., or use the card at page 18. Circle No. 21.

Aluminum safety hat for any head size

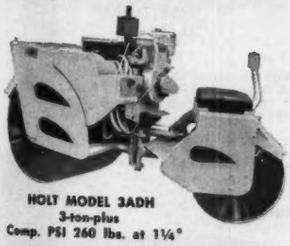
Willson Products offers a new aluminum lightweight safety hat.

Constructed with full brim for protection to neck, ears, and shoulders, this sturdy aluminum shell is formed in one piece and is ribbed for added strength. Brim edges are rolled for extra rigidity.

According to the manufacturer, these hats are completely sun-reflecting for hot-weather comfort. A special feature is Geodetic suspension, which is constructed to conform to any head and resist the tendency of the hat to shift, tilt, or crash against the skull under angular blows.

For further information write to Willson Products, Division of Ray-O-Vac Co., Dept. C&E, Second and Washington Sts., Reading, Pa., or use the Request Card at page 18. Circle No. 81.

HOLT ROLLERS



HOLT MODEL 3ADH
3-ton-plus
Comp. PSI 260 lbs. at 1¼"

FAST, ECONOMICAL, EFFICIENT COMPACTION

- Portable
- Short-turning
- 12½ h.p. converted by HOLT HYDRO DRIVE to 2-speed transmission
- Meets State specs. for highway patching
- Hydraulic center-point steering
- Electric starting
- Ideal for parking areas
- 5 sizes from ¾ ton to 3 ton

Write for literature and nearest dealer

HOLT

Independence 4, Oregon

For more facts, circle No. 359

RUGGED

For more facts, use Request Card at page 18 and circle No. 360

An aid to faster on-the-job cleanup of equipment such as bulldozers and power shovels is a small booster pump called Handy pump, available from The Gorman-Rupp Co. Easily transportable, the pump weighs only 13 pounds. It has a wide operating range of 2 gpm, 44 pounds pressure with 102 feet of head, up to 18 gpm, 16 pounds pressure with 37 feet of head. Powered by a ½-hp motor, it operates on ac or dc current. For further information write to **The Gorman-Rupp Co.**, Dept. C&E, 357 N. Bowman St., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 9.

For more facts of these products, circle the indicated number on the Request Card at page 18.

Portable winch hoist rated at 1,000 pounds

The Lug-All Co. announces the Model 1000-15 portable winch hoist.

This 7-pound unit has a rated capacity of 1,000 pounds and is equipped with 15 workable feet of 3/16-inch-diameter aircraft cable. It operates smoothly when rigged right side up, upside down, horizontally, or at any angle.

Light and compact, it is built on a high-strength aluminum-alloy frame that protects the drum flange and ratchet teeth when the hoist is used against cement floors, walls, or other rough surfaces. The interlocking pawl system will not slip when oily or even if used under water. Free release for letting out slack cable can be operated only when under no-load condition.

For further information write to The Lug-All Co., Dept. C&E, 355-E Lancaster Ave., Haverford, Pa., or use the Request Card at page 18. Circle No. 104.

the fastest, safest and surest way to...

a Leakproof Hose Connection

PUNCH-LOK HOSE CLAMPS

See Your Distributor or write direct for catalog and prices

The Sign of a GOOD Hose Clamp

PUNCH-LOK Company

Dept. J, 321 North Justine Street, Chicago 7, Illinois

For more facts, circle No. 361

FASTER POURS

with this side chute

Save time! Pour concrete with the use of the convenient EFCO Side Chute. After use, side chute is quickly replaced with regular EFCO panel. Send coupon for details of other money-saving EFCO features.

ECONOMY FORMS CORP.

Economy Forms Corp.
Box 129-E, H. P. Station
Des Moines, Iowa

Please send catalog on EFCO Steel Forms, and address of nearest sales office (there are 28 coast-to-coast).

Name_____

Firm name_____

Address_____

City_____ State_____

For more facts, use coupon or circle No. 362

45 LEVER TYPE models to choose from!

THE WORLD'S MOST COMPLETE LINE

SIMPLEX LEVER JACKS

SINGLE ACTING, RATCHET LOWERING
11 Models, 5 to 20 tons capacity. Full capacity on toe or cap.

EMERGENCY & BRIDGE JACKS
2 Models, 15 tons capacity. Pivot on base.

POLE PULLING & STRAIGHTENING JACKS
3 Models (One aluminum alloy) 5 to 15 tons capacity. Standard of Bell System.

REEL JACKS
3 Models (One Aluminum alloy) 5 to 10 tons capacity. "T" Base.

GEARED JACKS
3 Models, 25 to 35 tons capacity. Side toe lift.

MINE TIMBER JACKS
4 Models (One has trip mechanism). Single and double acting.

TRACK (TRIP) JACKS
13 Models (Five aluminum alloy) Single and double acting.

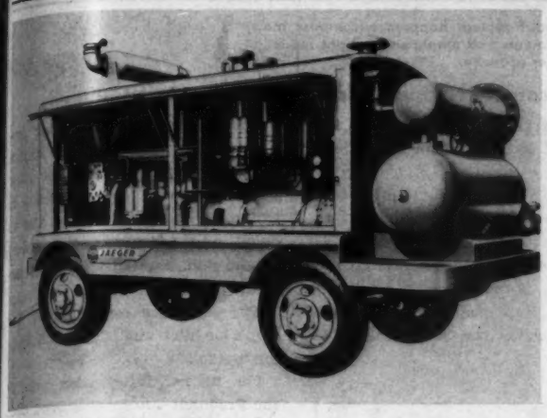
BELT TENSIONING JACK
5 ton capacity.

Also Lever type, Cable & Wire Tensioning, Pipe Pushing & Pulling, Tie Remover, Tie Replacer, and Siding & Flooring Jacks.

Look for further information on Hydraulic and Screw Jacks in other advertisements.

TEMPLETON, KENLY & CO.
2511 GARDNER ROAD
BROADVIEW, ILLINOIS

For more facts, circle No. 363



On the new Jaeger compressor, close automatic regulation of engine and compressor maintains 100-psi minimum air pressure under all normal demand.

New compressor delivers 900 cfm at 1,700 rpm

The Jaeger Machine Co. offers a rotary air compressor that delivers 900 cfm of air at an operating speed of 1,700 rpm.

Close automatic regulation of engine and compressor maintains 100-psi minimum air pressure under all normal demand. According to the manufacturer, engine speed modulation is smooth and stepless, and prevents any overrun or racing. Stopping and starting require only the half-turn of a regulator crank.

Standard equipment includes 2-pass exhaust muffler, automatic blowdown valve, swing-type check valve, copper-tube finned multipass oil cooler, and hour meter.

For further information write to The Jaeger Machine Co., Dept. C&E, 550 W. Spring St., Columbus 16, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 30.

Hydraulic track adjuster for crawler tractor

A hydraulic track adjuster, replacing a screw-type, has been developed by International Harvester Co.'s Construction Equipment Division for all future International TD-20 crawler tractors.

Track tension is increased by using a regular hand grease gun to force grease into a lubricating fitting on the track adjuster. The amount of grease pumped regulates the degree of tension. To ease tension, a relief screw is backed off to allow grease to escape.

The tension-relief screw is equipped with important safety features. When the screw is backed off, a check ball behind it comes away from its seat, permitting excess grease to be directed through a drilled passage running inside the track guide.

A slotting arrangement of the screw eliminates any danger of pressure buildup from behind as the screw is being backed off.

For further information write to the International Harvester Co., Construction Equipment Division, Dept. C&E, 180 N. Michigan Ave., Chicago, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 59.

DRILL HOLES
IN HARDEST CONCRETE
FASTER—EASIER!

...with the world's most efficient masonry drill! Here's why CONCRETE-TERMITE Drills give you faster, lower-cost drilling in any masonry:

- Up to 500% longer drill life because of CONCRETE-TERMITE's exclusive Nitride Hardening of dust-removing worm.
- Original Multiple Carbide Cutter design means straighter, smoother holes.
- Fully-Supported Cutters protect carbides from shearing.

Start today using...

CONCRETE-TERMITE

CARBIDE-TIPPED MASONRY DRILLS

Diameters from 3/16" to 6". Interchangeable shanks available for making drills up to 36" in length. Drills without water.

Send for FREE Catalog with drill recommendation chart, and name of nearest dealer.

RELTON CORPORATION
99 N. LOTUS AVE., PASADENA, CALIF.
For more facts, circle No. 365

Biggest development in pumps in a decade!

NEW CMC

WONDER-*Lite* LINE OF LIGHTWEIGHT PUMPS

- ALUMINUM PUMP BODY AND ENGINE... today's most portable pumps.
- CAST IRON VOLUTE AND IMPELLER... take roughest, toughest wear.

Here's a new line of lightweight pumps that can knock the socks off the "heavies" in PERFORMANCE . . . PORTABILITY!

Unique, simplified "aluminum-iron" design of CMC WONDER-Lites makes them extra compact, lightweight . . . extremely portable . . . yet plenty rugged for toughest pumping jobs.

Outperform any similar size pumps on the market! Prime automatically . . . RECORD FAST . . . even on suction lifts to 25 feet. Just the pumps for contractors, city maintenance departments, telephone companies, etc.

Available 4 models 1½" to 3" sizes with 4-cycle Briggs & Stratton all-aluminum engine.

A whopping 19,000 gallons of water per hour . . . YET WEIGHS only 97 POUNDS! That's the fantastic 3" Model W19A WONDER-Lite at left.

write for NEW FREE WONDER-*Lite* CATALOG

WONDER-*Lite* PUMPS

CONSTRUCTION MACHINERY CO., Waterloo, Iowa

☐ Rush catalog on new CMC WONDER-Lite pump line. ☐ Send name of nearest CMC pump distributor.

NAME
COMPANY
ADDRESS
CITY STATE

CONSTRUCTION MACHINERY CO., WATERLOO, IOWA

● DUAL PRIME PUMPS ● DIAPHRAGM PUMPS ● HI-PRESSURE & JETTING PUMPS

For more facts, use coupon or Request Card at page 18 and circle No. 366

The new Fruehauf cement hoppers encompass many design improvements and emphasize weight reduction along with larger capacity.

Mobile cement hoppers feature large capacity

A new type of cement hopper is announced by the Fruehauf Trailer Co.

According to the manufacturer, the hoppers are lighter than previous models and feature a full 26-inch butterfly gate at the bottom for quick unloading. Standard units have a 510-cubic-foot capacity, but units of larger capacities can be obtained.

Among the weight-reducing features are the all-aluminum 26-inch fill dome and interliners, the latter being removable for conversion to aggregate hoppers if desired. The fill dome and cover are of standard height and dovetail with most unloading chutes.

The units are complete with the firm's air hitch and ICC 12-volt lighting system.

For further information write to the Fruehauf Trailer Co., Dept. C&E, 10942 Harper Ave., Detroit 32, Mich., or use the Request Card at page 18. Circle No. 23.

Deep-cut attachment for subgrader models

A deep-cut attachment for Blaw-Knox subgrader Models GB and GC is available from the Blaw-Knox Co.

This optional equipment is designed for air-base work, and it offers a cutting depth range from 12 to 24 inches.

Other features of the subgrader, which excavates through vibration, include: two ranges of excavating widths for single or dual-lane paving; fully adjustable strike-off; quickly adjustable crown control; self-powered reverse travel; and fingertip hydraulic depth controls.

Additional optional equipment includes split conveyor flights, extra-long discharge horn, and pneumatic transportation and rubber traction wheels.

For further information write to the Blaw-Knox Co., Dept. C&E, 300 Sixth Ave., Pittsburgh, Pa., or use the Request Card that is bound in at page 18. Circle No. 102.

Masonry-saw blades have long-life design

A new line of masonry-saw blades is offered by the Black Diamond Blade Co., Inc.

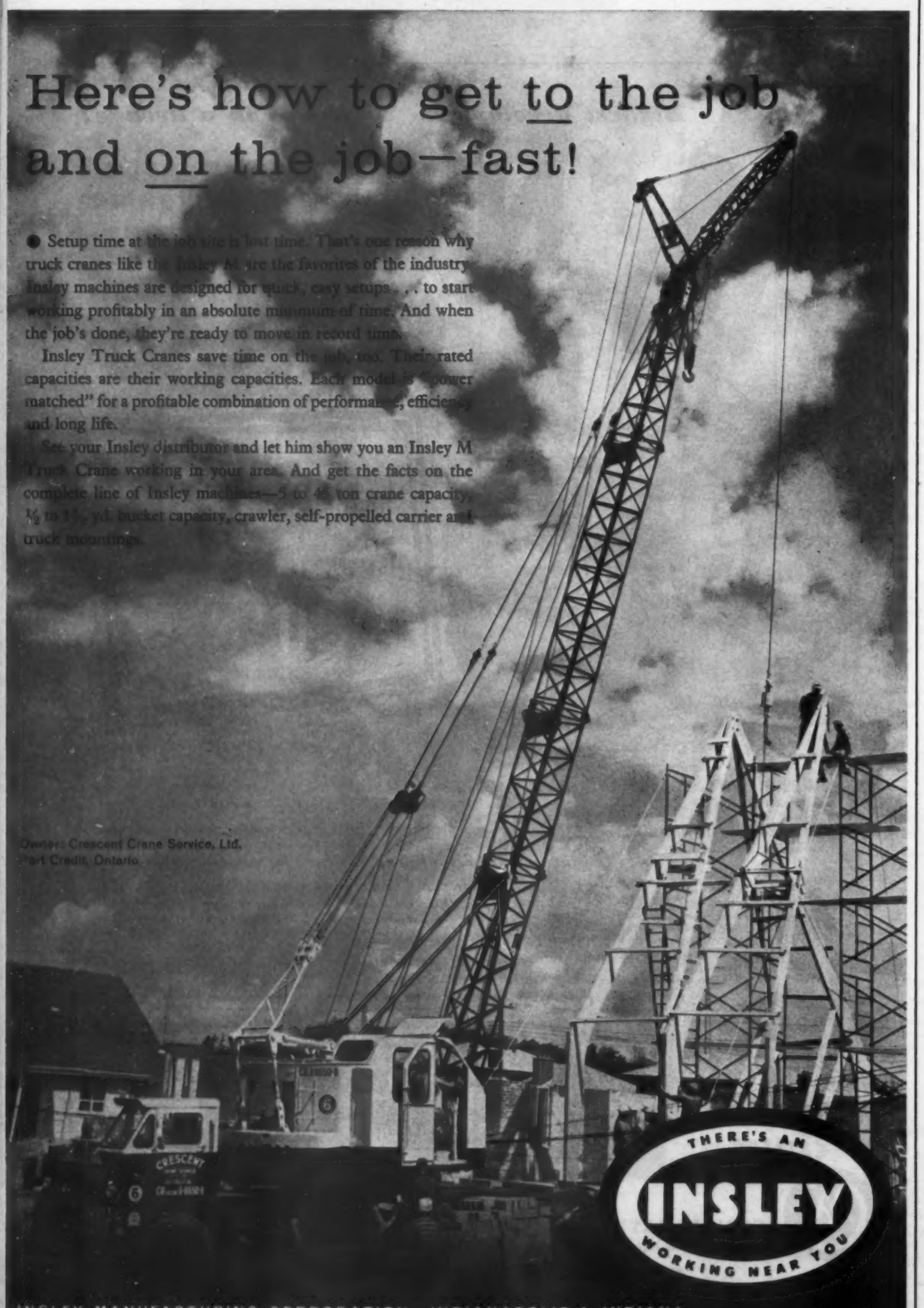
A tough Fiberglas reinforcement is said to make the blades shatterproof, either in use or when dropped.

Other features contributing to longer blade life are resistance to burning or loading under severe conditions and ability to automatically dress out nicks or chips while in use.

The blades are furnished in sizes ranging from 6 to 14 inches, fitting any arbor.

For further information write to the Black Diamond Blade Co., Inc., Dept. C&E, 9824 W. Capitol Drive, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 40.

←For more facts, circle No. 367


Here's how to get to the job and on the job—fast!
● Setup time at the job site is lost time. That's one reason why truck cranes like the Insley M are the favorites of the industry. Insley machines are designed for quick, easy setups . . . to start working profitably in an absolute minimum of time. And when the job's done, they're ready to move in record time.
Insley Truck Cranes save time on the job, too. Their rated capacities are their working capacities. Each model is "power matched" for a profitable combination of performance, efficiency and long life.
See your Insley distributor and let him show you an Insley M Truck Crane working in your area. And get the facts on the complete line of Insley machines—5 to 45 ton crane capacity, ½ to 1½ yd. bucket capacity, crawler, self-propelled carrier and truck mountings.
Owners: Crescent Crane Service, Ltd. Port Credit, Ontario
THERE'S AN INSLEY WORKING NEAR YOU
INSLEY MANUFACTURING CORPORATION · INDIANAPOLIS 6, INDIANA

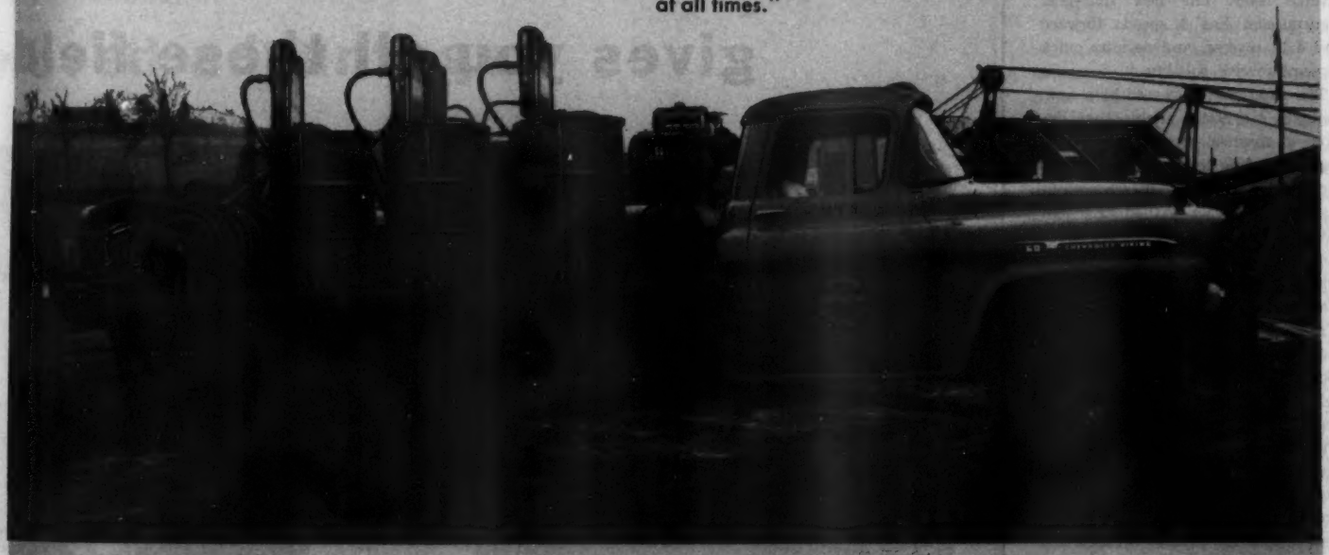
FULGHUM CONTRACTING CORPORATION

"Lubrication IN THE FIELD with the *Lincoln Lubrovan** helps us meet our production schedules"

says William P. Fulghum
vice president
Fulghum Contracting Corporation
Harrisburg, Pa.

"In our type of business," says Mr. Fulghum, "delays are costly, both to our profits and our reputation. We can't afford to have our equipment tied up too long for lubrication and servicing.

"By bringing lubrication *right to the job site* with our custom-designed Lincoln Lubrovan, we can operate with a minimum of downtime. Production schedules are easier to meet, and our equipment works better and lasts longer, because it's properly lubricated at all times."

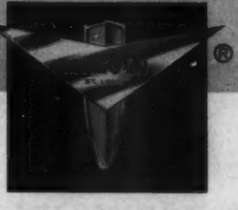


Lincoln Lubrovans and Lubmobiles lubricate equipment IN THE FIELD— *reduce downtime— increase equipment life*

*Trade Name Registered

STANDARD OR CUSTOM-DESIGNED PORTABLE LUBRICATION PACKAGES contain all the needed equipment—air compressor, lubricant pumps, reel-and-hose assemblies, etc.— to keep your 'dozers, scrapers, and other machinery operating at maximum schedules, with as little downtime as necessary.

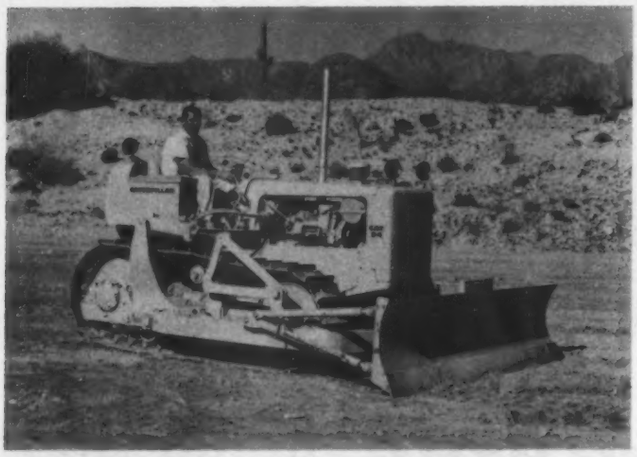
Whatever the size or type of your operation, Lincoln can provide a Lubrovan or Lubmobile to meet your needs exactly. Call the Lincoln representative in your area for complete information on this modern lubrication method, or write to us for Catalog No. 32 and Engineering Manual No. 33.



LINCOLN ENGINEERING COMPANY
Division of The McNeil Machine & Engineering Co.
4016 GOODFELLOW AVENUE • ST. LOUIS 20, MISSOURI

A8005

For more facts, use Request Card at page 18 and circle No. 368



The new D4 Series C tractor is the first in its size class to utilize a forward-reverse lever. The machine's engine develops 52 drawbar horsepower.

Tractor features include greater lugging ability

A new model of the D4 tractor, the Series C, has been announced by the Caterpillar Tractor Co. Rated at 52 drawbar horsepower, this tractor has 25 per cent more lugging ability than previous models, as well as a new starting system and greater ground clearance.

Available with either a standard or an optional lower-speed transmission, the new D4 is said to be the first in its size class to have a forward-reverse lever. The new spur-gear transmission has 5 speeds forward and 4 in reverse, and permits quick forward-reverse shifting.

The machine is powered by a new, compact 4-cylinder engine that delivers 65 flywheel horsepower at 1,600 rpm. According to the manufacturer, the tractor develops 13,000 pounds maximum drawbar pull in first gear with a standard transmission. With the optional transmission, the D4 develops a maximum of 14,600 pounds drawbar pull.

A new, highly versatile hydraulic control, the No. 143, is standard. This control, with one internal valve, can be utilized to control a bulldozer blade, tool bar, or rear implement. With an additional internal valve, the control is used for either one front-mounted tool and a rear-mounted or towed tool, or two rear implements. By adding an external third valve, the No. 143 is used to control one front-mounted and two rear-mounted or towed tools.

Compared with prior models, the Series C is seven inches longer and weighs about 300 pounds more.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 52.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

Telescopic jack adjusts vertically, horizontally

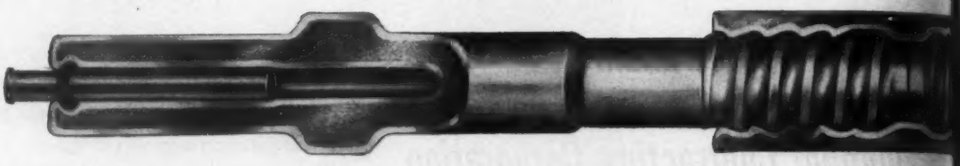
A new telescopic jack, adjustable both vertically and horizontally, has been introduced by the Williams Form Engineering Corp.

Designed to support falsework in forming girder arches in bridge construction, to cut excessive wood shoring, and to reduce wooden wedging, the jack is available in sizes up to 30 inches in height and from 16 to 26 inches in tee-beam widths. It is 1⅛ inches in diameter.

The new jack is said to have a high safety factor and is adjustable a various beam depths and widths and to dead-load deflection points, thus speeding erection time. It has vertical adjustment with Williams wing nut and Vibra-Lock brackets, and horizontal adjustment with retracting round bars.

For further information write to the Williams Form Engineering Corp., Dept. C&E, 1501 Madison Ave., S. E., Grand Rapids 7, Mich., or use the card at page 18. Circle No. 72.

You'll scrap all your old ideas about drill steel when you try



ONLY GARDNER-DENVER HI-L

gives you all these field-prov

ALWAYS UNCOUPLES BY HAND

New HI-LEED thread design makes wrench unnecessary. Gardner-Denver engineers have incorporated field-proved reverse buttress design into an entirely new thread form that always uncouples by hand.

Ford's new subframe and equipment hydraulic package for the Fordson Power Major and Fordson Major diesel tractors now offers users a basic frame to which they can attach the company's Super-Duty loader, backhoe, or counterweight boxes in any combination.

Hydraulic package adds to tractor versatility

A subframe and equipment hydraulic package is available for mounting the new Ford Super-Duty loader on Fordson Major diesel and Fordson Power Major tractors.

This package now enables the user to mount any combination of Super-Duty loader, backhoe, or counterweight boxes on the tractor to fit job needs.

The loader has a capacity of more than 1 ton, a lift capacity of 2,500 pounds, a breakaway capacity of 5,500 pounds, and can lift a capacity load to a height of over 11 feet. In addition, it can fill any standard-size dump truck from one side of the vehicle.

The tractor operator has unobstructed vision forward over the tractor because of the loader's diagonal side bracing. Furthermore, a bucket-position indicator enables the operator of the loader to know the bucket's position without guesswork.

Buckets are available with capacities of ⅝ and ¾ yard. A light-material bucket with a capacity of a full yard is also available. All buckets are tread width or more.

Other attachments include a material fork, crane, dozer blades, and bucket and blade scarifiers.

For further information write to the Ford Motor Co., Tractor and Implement Division, Dept. C&E, 2500 E. Maple Road, Birmingham, Mich., or use the Request Card at page 18. Circle No. 105.

Portable 2-way radio is hand-carried unit

A lightweight, portable 2-way FM radio unit has been announced by the Mobile Radio Department of Allen B. Du Mont Laboratories, Inc.

Designed for use by contractors, field engineers, survey crews, and others with need for instant 2-way communication while on foot, the new Portacom weighs only 8 pounds

and is less than 12 inches long. It includes a handset, FM receiver, 1 or 2-channel FM transmitter, demountable whip antenna, battery pack, and carrying strap. Units are available with loudspeaker and palm microphone, and for use on the 25 to 54-mc frequencies or 144 to 174-mc band. Power output is in excess of 1 watt on the lower frequencies.

For further information write to the Mobile Radio Dept., Allen B. Du Mont Laboratories, Inc., Dept. C&E, 750 Bloomfield Ave., Clifton, N. J., or use the Request Card that is bound in at page 18 of this issue. Circle No. 64.

ou try NEW GARDNER-DENVER *HI-LEED* STEEL

HI-LEED DRILL STEEL

ld-proved advantages

CUTS DRILLING TIME ON EVERY HOLE

HI-LEED steel saves time in adding rod . . . and ease of uncoupling, without use of wrenches, helps drill hole faster.

SENDS MORE IMPACT TO THE BIT

HI-LEED sectional steel transmits drill impact almost as well as a solid rod. That's because precision-milled threads on rod and coupling are in close contact over a large total area, thus holding rod ends firmly together.

DRILLS MORE FOOTAGE PER ROD

HI-LEED rods are designed to last longer than any other sectional steel, and the wide thread peak assures maximum wear.

Design details are carefully engineered to eliminate much of the usual friction and stress concentrations. Carburizing and shot-peening give the steel a hard surface and tough inner core.

PREVENTS LOST HOLES

New HI-LEED design keeps mating parts snug—rods won't uncouple in the hole or while pulling out. Other thread forms may not hold a tight connection and many rod strings have been lost in the hole while pulling out with rotation on.

Drillers who have used this unique and revolutionary Gardner-Denver thread design are enthusiastic about its convenience and economy. Give it a try on your own rock drills—you'll soon see why. Call your Gardner-Denver drill steel specialist, or write for new bulletin on HI-LEED steel.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

For more facts, use Request Card at page 18 and circle No. 369

Instant reverse and torque converter, full-time power steering, simplified controls, 5-speed transmission, and individually controlled left and right brakes are among key features of the Massey-Ferguson Model 1001 tractor shovel. Rated at 1-cubic-yard standard bucket capacity, this rig is useful for a variety of operations. Its attachments include angledozer, lift fork, swinging crane, scarifier, backhoe, and rotary broom, as well as Ram pickup sweeper, rotary snow loader, and blacktop spreader. For further information write to the **Massey-Ferguson Industrial Div.,** Dept. C&E, 1009 S. West St., Wichita, Kans., or use the Request Card that is bound in at page 18. Circle No. 16.

MOBILE OFFICE Units are low in cost . . . Built to your specifications . . . There's a unit to fit your every need.

Because MOBILE OFFICE Units are easy to move from job to job, they enable you to have office, engineering, paymaster and other facilities at every point of your operation.

These units are economical, time saving, rugged and durable. They are self-containing, and are available with air-conditioning, and can be fitted to your specifications.

MOBILE OFFICES are being used by major contractors and other major businesses throughout the United States. In every case they have proven their worth.

Remember, whatever your needs may be, a MOBILE OFFICE Unit can be built to fit your requirements.

If it's Mobile . . . We Build It!

MOBILE OFFICE, INC.
Phones; DOrchester 3-1048-9

7314 Stony Island Avenue, Chicago 49, Illinois
For more facts, circle No. 370

"HYDROWAY® world's most practical all purpose dynamometer and it's hydraulic

Model pictured shows Pre-Set Pointer, Used for Setting—Not to Exceed Loads, etc.

"HYDROWAY" Hydraulic Dynamometers are for practically all kinds of heavy duty weight and tension measurement for cable anchoring devices; equalizing guy-wire tension; measuring suspension bridge strain and for use as traction dynamometers. HUNDREDS OF USES: Such as Torque testing, Tensile testing, Traction testing. Can be used as a hanging scale for weighing, check weighing and inventory material weighing.

"HYDROWAY" Dynamometers are accurate; portable; compact; ruggedly built; maintenance free.

• CAPACITIES 0-5000 pounds to 0-10,000 pounds • Dial diameter—6" • Weather proof • No oiling or fluid required • Permanently sealed • Economically priced

Guarantee: All "Hydroway®" Dynamometers are guaranteed to be free of defects in workmanship and materials.

Made by the originators of "HYDROSCALE®"
(world's largest manufacturers of Hydraulic Crane Scales).

HYDROWAY SCALES, INC.
31298 STEPHENSON HIGHWAY • ROYAL OAK, MICH.
For more facts, circle No. 371

Plummet transit tripod available in two models

A wide-frame tripod of the shifting head type is now available in two models for use on Gurley optical plummet transits.

Rounded legs are of straight-grain maple, fitted to an all-metal tripod head. The head shifts 1¾ inches in any direction in a horizontal plane. Model 447 comes with extension legs 61 inches long, closing to 31 inches; Model 442 has fixed-length legs, 56 inches long.

Hinge joints are of nylon, and the shifting head is of the multigroove type which provides greater stability and less chance of wear. The head is permanently lubricated.

For further information write to the Engineering Instruments Division, W. & L. E. Gurley, Dept. C&E, 518 Fulton St., Troy, N. Y., or use the Request Card at page 18. Circle No. 89.

New electric plant has dual ac voltage

The Universal Motor Co. announces a self-contained electric generating plant that will deliver its full capacity in either 110 or 120-volt ac. Two separate convenient receptacles are provided.

Designated Model 41-BHS, the new plant is powered with a Briggs & Stratton air-cooled engine and has a capacity of 2,500 watts. Any amount of voltage may be used up to the full capacity of the plant.

For further information write to the Universal Motor Co., Dept. C&E, 641 Universal Drive, Oshkosh, Wis., or use the Request Card at page 18. Circle No. 48.

The Model 41-BHS electric generating plant made by Universal Motor Co.

WISCONSIN TILT TRAILERS

engineered for efficiency

Perfectly balanced, the rugged, dependable Wisconsin Tilt Trailer cuts job costs . . . offers safe, fast, economical, one-man loading and unloading. 16-ton capacity, 8' x 2" mat deck, extra frame depth for added strength. Automatic hydraulic EASY UP . . . EASY DOWN deck and low load angle assure time and money saving efficiency every haul.

Model 1600 — 16 Ton

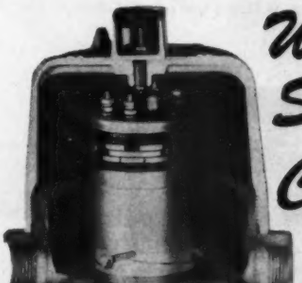
First choice the world over . . . doubler plate at all critical welds . . . exclusive unbreakable rear channel mounting . . . can't tear out EVER!

ONE MAN CAN HITCH UP, LOWER DECK, LOAD AND ROLL IN MINUTES

Model 1600 only $2600 w/tires & deck, plus freight & tax

WISCONSIN TRAILER COMPANY, INC. Richfield, Wisconsin Phone HUBERTUS

For more facts, circle No. 372



Where Safety Counts

GH-E Series

EXPLOSION PROOF
SPEED SENSITIVE SWITCHES

All GH series of cable driven governors and switches are available in this GH-E series. This housing meets the specifications for class 1 group D, Explosion Proof Equipment. For further information, write for Bulletin 504-A.

SYNCHRO-START PRODUCTS, INC.
8151 N. RIDGEWAY AVE., SKOKIE, ILL.

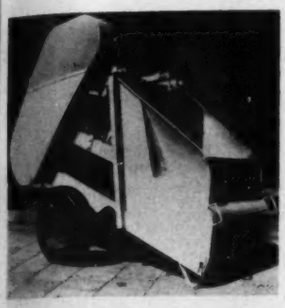
For more facts, circle No. 373

For more facts on these products, circle the indicated number on the Request Card at page 18.

New 200-ton jet conveyor is one-man operated

A jet conveyor with a displacement of approximately 200 tph over a distance of about 82 feet is announced by the Netherlands Trade Commission.

The unit reportedly can reach a height of 32½ feet. Adjustment to distance and height is simple; operation is by one man.



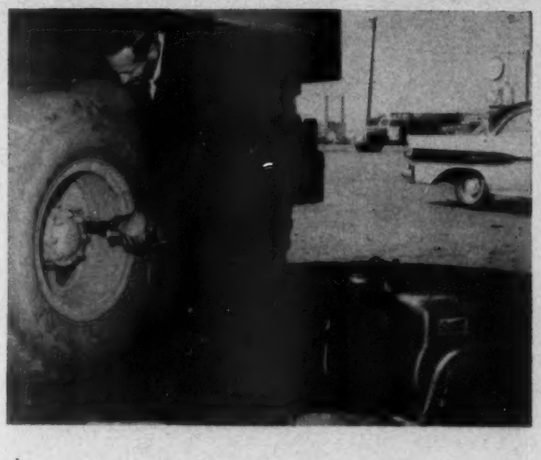
The Dutch-built jet conveyor, for use in loading sand and gravel, can reach a height of 32½ feet and a length of 82 feet.

This conveyor can be driven by a gasoline or diesel engine or electric motor with a power output of 10 to 15 horsepower at 1,500 rpm.

Over-all length is 7 feet 3 inches; over-all width, 3 feet 6 inches; maximum height, 7 feet; minimum height, 4 feet 6 inches. The jet conveyor can be used to throw sand and gravel into trucks and silos.

For further information write to the Netherlands Trade Commission, Dept. C&E, 551 Fifth Ave., New York, N. Y., or use the Request Card at page 18. Circle No. 108.

Changing giant tires at the John N. Brocklesby Transport Co., Ltd., in Montreal, Canada, is handled by an electric lug wrench powered by an Onan portable generating plant. According to the firm, the 2,500-watt Onan provides plenty of power, not only for the lug wrench but also to floodlight the area for night emergencies. Brocklesby claims more than two hours' savings per tire over conventional hand changing since purchasing the wrench and generator. For further information write to **D. W. Onan & Sons, Inc.**, Dept. C&E, 2515 University Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 50.



save life & property with New Model Falcon®

- Simple visual inspection with new sight glass — added neatness of design.

No one can place a price on the possible loss of lives due to fire. But Falcon Automatic Fire Detectors & Systems can give early warning of fire to protect lives and guard property.

Falcon Automatic Fire Detectors & Systems are:

- LISTED BY U/L
- SELF-CONTAINED (no wires or batteries)
- FULLY GUARANTEED

...and they are low in cost!

WRITE for particulars — and free, informative "Sounds for Safety" folder! Dept. CE

Falcon® ALARM CO., INC.
SUMMIT, NEW JERSEY

For more facts, circle No. 374

Opens 2 miles of trench per day

widening blacktop highway in Southern Illinois

That's profitable trenching!

But it's routine for Rockford Blacktop Construction Company, a veteran of many years on this type of work. On the job pictured, Parsons 150 Trenchliner had to chew through edge of existing blacktop roadway (to assure close bond with new strip of blacktop) . . . yet the 150 averaged more than 10,000 feet of trench per day.

To help set this pace, the 150 was equipped with optional crawler sprocket for faster lineal travel. The point worth noting is the ability of the 150 to take this high-speed operation in stride. It gives you added proof of the perfect balance and ruggedness of this machine for handling any trenching job that comes your way.

Up to 25 ft./min., 5 3/4 feet deep

With standard drive, the 150 opens from 12 inches to 25 lineal feet of trench per minute — 16 to 26 inches wide, at any depth to 5¾ feet. Hydraulic ram raises or lowers digging wheel to give you fractional-inch control of trench-depth. Another hydraulic ram tilts the mast for travel clearance and for convenient trailer loading. Cast steel buckets have self-sharpening, reversible, tap-in teeth. We'd like you to know more about this heavy-duty trencher. See your Parsons distributor for complete details.

Mile-a-week pace on 5-foot-wide aqueduct

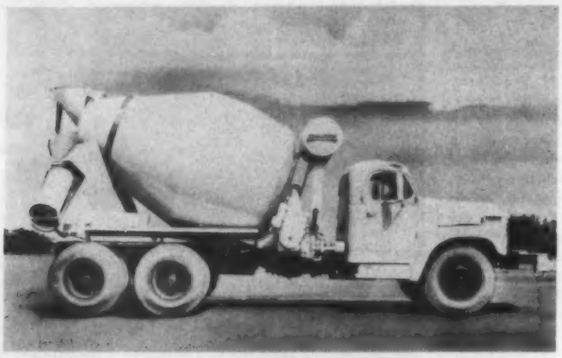
Equipped with dual ladder-type digging booms, this big Parsons 310 averaged 1120 to 1200 lineal feet of 60" trench per day . . . maintained same pace with sidecutters added to trench 66"-wide sections. The complete Parsons line gives you trench widths from 8 to 72 inches, depths to 19 feet . . . in wheel and ladder-type Trenchliners, also tractor-mountable backhoes.

P7

PARSONS COMPANY NEWTON, IOWA
(A Division of Koehring Company)

LADDER TRENCHERS • WHEEL TRENCHERS • BACKHOE LOADER ATTACHMENTS

For more facts, use Request Card at page 18 and circle No. 375



On the new Challenge truck mixer, four transmission ranges are available for mixing and discharging. The unit is offered in sizes up to 8½ cubic yards.

Truck mixer features 4-speed operation

The new Challenge IV SPEED ETO (engine takeoff) truck mixer now offers operators 4-speed operation for mixing and discharging.

This unit has a slow agitating range for premix hauling; a fast agitating and slow mixing range that provides correct drum speed for long hauls; a fast mixing range for high-speed job-site mixing and short hauls; and a high-speed range for faster charging. All four transmission ranges are also available for discharging.

Another important feature of this truck mixer is the simple, short drive line with an electrically controlled air clutch located inside the power transfer case. The mixer drive mechanism operates only when necessary.

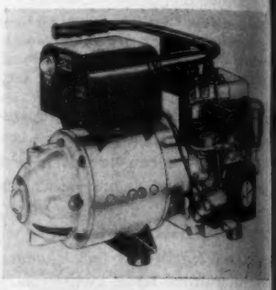
The Challenge IV SPEED ETO is equipped with dual Electro-Aire controls, located at the rear of the mixer and inside the cab. There are no levers to work—just a flip of the switch to stop, start, or reverse the drum.

The new unit is made in 5½, 6, 6½, 7, 7½, 8, and 8½-cubic-yard sizes.

For further information write to Challenge-Cook Bros. Co., Dept. C&E, 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card at page 18. Circle No. 76.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card at page 18.

Electric plants feature automatic idling control



Three new 3,600-rpm portable gasoline electric plants with an automatic idling control designed to reduce noise, save fuel, and increase engine life have been introduced by the Winpower Mfg. Co.

All three units—1,500, 2,500, and 3,500-watt—feature the Econ-o-mizer automatic idling control that permits the plant to idle until a load of 100 watts or more is applied, at which time it revs up to operating speed and voltage. When the load on the plant is removed, it once again drops back to an idling speed. All units are powered by Briggs & Stratton 4-cycle air-cooled engines.

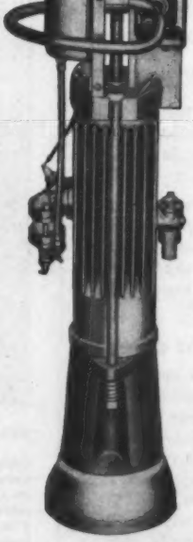
Standard equipment includes stop switch, pilot light, vibration dampers, rope or recoil starter, two 15-amp grounding-type receptacles and—for the 2,500 and 3,500-watt models—one 30-amp 3-wire twist-lock receptacle, plus a convenient carrying handle or dolly.

For further information write to the Winpower Mfg. Co., Dept. C&E, Box 711, Newton, Iowa, or use the card at page 18. Circle No. 71.

Where SPECIFICATIONS call for . . . . .

HIGH DEGREE SOIL COMPACTION

BARCO RAMMERS are THE ANSWER!



YOU can't get *high degree* SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches.

ONE MAN OPERATION—On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On 18" trench backfill, using lifts up to 24", the rate is 360 to 600 feet per hour.

ASK FOR A DEMONSTRATION—We will be glad to arrange a demonstration for you; see our nearest distributor or write.

SEND FOR A COPY OF CATALOG 621.

Sold and Serviced by the Nation's Leading Distributors

BARCO MANUFACTURING CO.
518D Hough Street • Barrington, Illinois

BARCO RAMMER *for High Degree Soil Compaction*
BARCO-VIBRA TAMP *for Granular Fill and Bituminous Surfacing*

For more facts, use Request Card at page 18 and circle No. 376

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300%—special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

63 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:
• Open Gears, Dipper Sticks, Cams • Enclosed Gear Cases • Wire Rope and Cable
• Hydraulic Units, Torque Converters • Roller, Ball, and Sleeve Bearings • Speed Reducers

Est. 1893
THE WHITMORE MANUFACTURING CO.
LUBRICATING ENGINEERS
CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272

For more facts, use Request Card at page 18 and circle No. 377

When handling sand and other small-lump bulk materials, the Stephens-Adamson Swivel-Piler reportedly increases conveyor storage range up to ten times. Mounted on the discharge end of a storage conveyor, the unit will throw material in any direction over an arc of 270 degrees. Consisting of a centrifugal thrower unit complete with hopper and swivel joint, it can be mounted as a unit beneath the discharge end of practically any portable or fixed belt conveyor. The trajectory of material can be raised or lowered from 8 to 40 degrees by means of an operating adjusting lever. The Swivel-Piler is available in 10 and 16-inch-wide belt sizes. For further information write to the **Stephens-Adamson Mfg. Co.,** Dept. C&E, 275 Ridgeway Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 46.

Truck and davit crane has 1,500-pound capacity

The new Thern Model H-550B truck and davit crane is designed so that when it is mounted on a truck the boom can be folded down out of the way for low clearances. Folding is accomplished by pulling just one pin in the boom support.

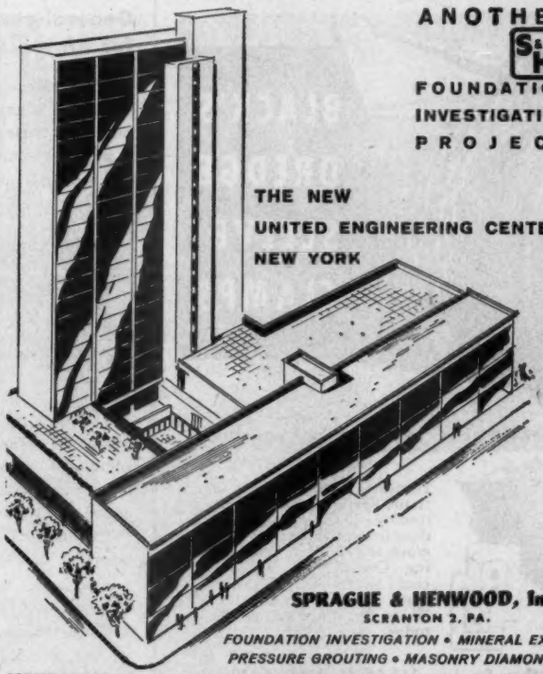
Maximum lifting capacity is 1,500 pounds with the boom retracted to its minimum reach of 39 inches. With boom extended to its maximum 54-inch reach, lifting capacity is 1,000 pounds.

The crane is easily installed, and one man can safely handle lifting, lowering, or positioning of heavy or awkward loads.

The unit is powered with a Thern Model 44W heavy-duty double-gear hand winch rated at 2,500-pound capacity. Lifting height from the floor is 7 feet 6 inches with boom extended. Total height is 8 feet in this position. Total height, floor to boom top, with boom fully retracted is 7 feet 1½ inches. With boom folded, the height from floor to top of winch is 51 inches.

Base dimensions are 12×12 inches. The winch comes with 19 feet of ¼-inch wire rope supplied.

For further information write to the Thern Machine Co., Dept. C&E, 3602 Fourth Goodview, Winona, Minn., or use the Request Card at page 18. Circle No. 74.



ANOTHER S&H FOUNDATION INVESTIGATION PROJECT

THE NEW UNITED ENGINEERING CENTER NEW YORK

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.

FOUNDATION INVESTIGATION • MINERAL EXPLORATION
PRESSURE GROUTING • MASONRY DIAMOND DRILLING

OFFICES: NEW YORK • PHILADELPHIA • PITTSBURGH • ATLANTA • GRAND JUNCTION, COLO. • BUCHANS, NFLD.

For more facts, use Request Card at page 18 and circle No. 379

New All-Purpose Winch and Hoist Works Off Any 6- or 12-Volt Battery

The new MY-TE all-purpose winch and hoist operates from any 6- or 12-volt battery. Lifts 2500 pounds! Pulls 5000 pounds! Mounts on truck, car, boat – anywhere – with just six bolts. It's portable – can be quickly shifted from one job to another by one man. Only 27" l. x 12" w. x 14" h. Weighs just 60 lbs. Large drum with 5½" diameter flanges has capacity of 150 feet (¼" cable); 70 feet (⅜" cable). Stress proof shafts and gears with powerful 175 to 1 ratio, Timken bearings, sealed gear housings, clutch for fast no-load operation, constant pressure brake for cable reeling. Ten-foot remote cable has forward and reverse control. Free load drum speed — 22 rpm. Backed by 90-day warranty. Costs far less than winch with power take-off . . . less than any winch of equal size or capacity — just $237.50. (Also: 110-volt model $280.00.) Both fob, Indianapolis.

FREE Bulletin . . . Dealer Inquiries Invited

CITY ENGINEERING CO., INC.
2947 Massachusetts Ave. • Indianapolis 18, Ind.

For more facts, circle No. 378

MOVES with the JOB! NO CONCRETE PITS!

THURMAN **Portable Truck Scale**

OTHER THURMAN SCALES:
PIT • WAREHOUSE • INDUSTRIAL • WHEELBARROW
LIQUID WEIGHING • BATCHING • AUTOMATIC

Sets up in minutes . . . accurate, precision weighing *on-the-site.* Complete steel deck construction. Low original cost . . . no maintenance costs. Can be installed as a pitless scale. Saves pit costs. WRITE OR WIRE FOR BULLETIN 601

CAPACITIES: 20 to 52 tons
DECK LENGTHS: 18 to 43 ft.

Precision Scales THURMAN *Since 1918*

THURMAN SCALE COMPANY, 1939 REFUGEE ROAD
DEPT. CE-2, COLUMBUS, OHIO

For more facts, use Request Card at page 18 and circle No. 380

New England Carbide's new drilling method is said to reduce heat, friction, and noise to a minimum.

Dry, dustless drilling in reinforced concrete

A new method for dry, dustless drilling in reinforced concrete is announced by the New England Carbide Tool Co., Inc. Called Method A, it incorporates the firm's Cyclo-core bits, dust exhaust swivel, power unit, and dust collector.

According to the company, this method of removing dust and steel cuttings from the hole reduces heat, friction, and noise to a minimum. The full power of the drilling equipment is applied to the bit, reportedly resulting in a faster rate of penetration and longer bit life.

The carbide-tipped bits used are said to cut easily through steel reinforcing rods. The Cyclo-core drilling machine is fully portable, requires no bracing or fastening to walls or floors, and can be adapted readily to any drilling problem. Only one man is needed to operate the machine.

For further information write to the New England Carbide Tool Co., Inc., Dept. C&E, 55 Commercial St., Medford 55, Mass., or use the Request Card at page 18. Circle No. 107.

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U. S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply . . . positive in action. Write for illustrated folder, today.

The Black Brothers Co., Inc., 910 4th St., Mendote, Illinois

For more facts, circle No. 381

General-purpose valve for lift trucks, others

The Hydreco Division of The New York Air Brake Co. announces the new V-34 Series Hydreco valve. This is a general-purpose valve employing the sectional principle, designed for

use on lift trucks and other mobile equipment on which supplementary operating features are frequently added to standard models.

The basic V-34 Series valve is composed of a 2-plunger cast-in-block section with integral pilot-operated relief valve. All mounting holes, pump and tank connections are in the basic section. Additional operating sections may be added to the valve in the field as required without disturbing the original piping connections.

For further information write to the Hydreco Division, The New York Air Brake Co., Dept. C&E, 9000 E. Michigan, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 92.

CONTRACTORS REDUCE LABOR COSTS with hydraulically mechanized MATERIALS HANDLING

the HIAB 170 SPEED LOADER

Contractors such as Peter Kiewit Sons' Co., Guy F. Atkinson Co., and many others are reducing costs with the one man operated, fully hydraulic, Hiab Speed Loader. The Hiab provides hydraulically mechanized materials handling on a wide variety of utility jobs at LOW COST.

The HIAB 170 offers a range of lifting capacities from 6000 lbs. on the shortened boom of 5' to 2200 lbs. on a full boom of 13'. The boom length is easily adjustable through hydraulic control. Control is from either side of the truck cab.

Ideal for general maintenance work, the HIAB 170 will lift up to 20' above ground level at a maximum speed of 20" per second. Crane action is positive and accurate. 200° or 360° swing arc. When not in use the HIAB 170 folds snugly behind the cab, taking only 15" of space. This leaves the entire truck bed open for load.

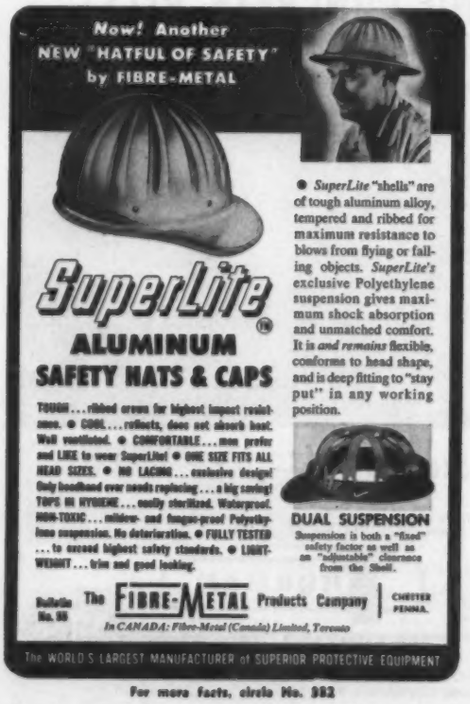
Also available is the HIAB "Bimbo" Model 290 — a smaller version of the HIAB 170, with similar design features.

WRITE FOR NAME OF YOUR NEAREST DEALER

Stance BROS. & SALES INC. — 1666 Ninth Street, Santa Monica, California

Stance MIDWEST SALES INC. — 11901 So. Avenue "O", Chicago 17, Illinois

For more facts, circle No. 383


Now! Another
NEW "HATFUL OF SAFETY"
by FIBRE-METAL
SuperLite
ALUMINUM
SAFETY HATS & CAPS
TOUGH . . . ribbed crown for highest impact resistance. • COOL . . . reflects, does not absorb heat. Well ventilated. • COMFORTABLE . . . men prefer and LIKE to wear SuperLite! • ONE SIZE FITS ALL HEAD SIZES. • NO LACING . . . exclusive design! Only headband ever needs replacing . . . a big saving! TOPS IN HYGIENE . . . easily sterilized. Waterproof. NON-TOXIC . . . mildew- and fungus-proof Polyethylene suspension. No deterioration. • FULLY TESTED . . . to exceed highest safety standards. • LIGHTWEIGHT . . . trim and good looking.
• SuperLite "shells" are of tough aluminum alloy, tempered and ribbed for maximum resistance to blows from flying or falling objects. SuperLite's exclusive Polyethylene suspension gives maximum shock absorption and unmatched comfort. It is and remains flexible, conforms to head shape, and is deep fitting to "stay put" in any working position.
DUAL SUSPENSION
Suspension is both a "fixed" safety factor as well as an "adjustable" clearance from the Shell.
The FIBRE-METAL Products Company
CHESTER PENNA.
In CANADA: Fibre-Metal (Canada) Limited, Toronto
The WORLD'S LARGEST MANUFACTURER of SUPERIOR PROTECTIVE EQUIPMENT

For more facts, circle No. 382

Diazo printer utilizes violet-ray tube

A rotary diazo white printer that operates with a violet-ray tube, and is said to combine higher output with clearer printing, is announced by the Warren Electr-O-Line Corp.

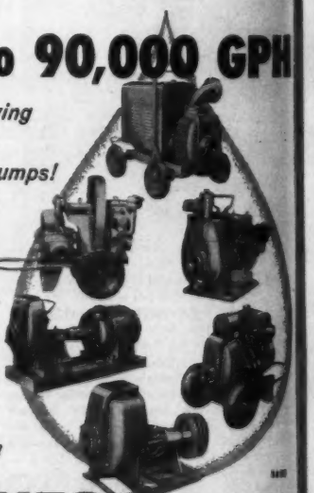
Known as Electr-O-Line, it is designed for use where application does not involve a large volume of printing. No warm-up period is required in starting operation. Features include ease of operation, emergency reverse, ball-bearing suspension, and a heavy-duty fully enclosed motor.

The Electr-O-Line operates on ordinary 110-volt current.

For further information write to the Warren Electr-O-Line Corp., Dept. C&E, Detroit, Mich., or use the Request Card that is bound in at page 18. Circle No. 70.

4000 to 90,000 GPH

Keep jobs moving with BARNES construction pumps!



27 Self-Priming Centrifugal Pumps engineered to move more water faster on excavating, mining and general construction jobs . . . prime and reprime without fail even during intermittent service. Portable Diaphragm models to handle semi-solid seepage faster, too. All constructed and pre-tested to give you Barnes *Blue Ribbon Quality!*

BARNES

Barnes Manufacturing Co. Mansfield, Ohio

Get a FREE copy of our Construction Pump Selector No. 320 from any Barnes distributor.

For more facts, circle No. 384

The Curb-Loader is equipped with two tie rods for hookup to a truck. The equipment moves along at the speed required by the curbing machine.

Curbing-machine loader is versatile unit

The Childers Curb-Loader is a ruggedly built machine that receives asphalt or non-slump concrete from a dump truck or mixer, and then carries the material to the curbing machine by means of a main screw conveyor and a flight conveyor.

The conveyors are driven through clutches by a self-contained gasoline engine in the loader. The angle-flight conveyor is adjustable up and down, will pivot 45 degrees, and is removable for transporting.

The four Curb-Loader wheels are adjustable to two positions—one for operating, the other for transporting.

According to the manufacturer, the new machine can be used for the backfilling of shoulders and median strips. It eliminates hand labor and leaves the roadway surface clean.

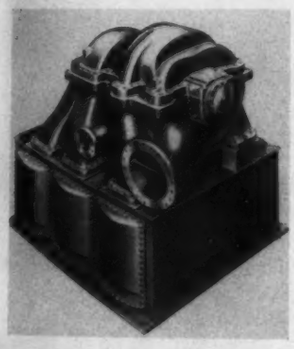
For further information write to Childers Mfg. Co., Inc., Dept. C&E, P. O. Box 6185, Albuquerque, N. Mex., or use the Request Card at page 18. Circle No. 65.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card at page 18.

Powerful air compressor has multistage design

A new, high-efficiency, multistage 110-psi centrifugal air compressor has been introduced by the Clark Bros. Co., a division of Dresser Operations, Inc.

Designated H Line, this series features integral intercoolers between the stages of compression for highest efficiency. Six case sizes are available with horsepowers ranging from 1,000



to 8,000 bhp and capacities from 5,000 cfm. Each unit is furnished as a complete package, including matching driver, intercoolers, and lubricating system.

A simple rotative machine, the Type H compressor does not require large foundation blocks. The centrifugal design assures steady flow and eliminates the need for large bottles or receivers, thus further minimizing installation expense.

The compressor is ideally suited for single-unit 100 per cent operation, or as a high-capacity base load machine. It can be furnished with an induction motor or synchronous motor, or can be adapted for other types of prime movers.

For further information write to the Clark Bros. Co., a division of Dresser Operations, Inc., Dept. C&E, 621 17th St., Olean, N. Y., or use the card that is bound in at page 18. Circle No. 88.

TDM Self-Propelled Carrier has U-Bar construction which permits drilling true vertical holes on rugged terrain. Wide crawler pads and long ground contact give exceptional stability.

Stable and Powerful!

THE JOY 450 DUAL ROTATION DRILL

The new Joy 450 Dual Rotation Drill mounted on the sturdy Joy TDM self-propelled carrier is the modern way to mass produce blast holes economically. The 450-DR drill is the newest and fastest thing in percussion drills. A powerful air motor, geared to the chuck, gives hammer-free rotation for steel changing, and assists rifle bar rotation when the drilling gets tough. It can bottom holes that other drills can't finish—and save you money.

U-Bar feed mounting on the TDM carrier provides the most stable arrangement possible for productive drilling, and is versatile enough to drill holes at practically any angle. Fast tramming and instant response to the completely automatic controls enable the TDM to move quickly, and set up fast.

Among 4½" bore machines, the TDM mounted 450-DR drill is unbeatable in speed, power, and maneuverability. Competitive tests have proven it. For complete information, write for Bulletin 1018-21.

1018

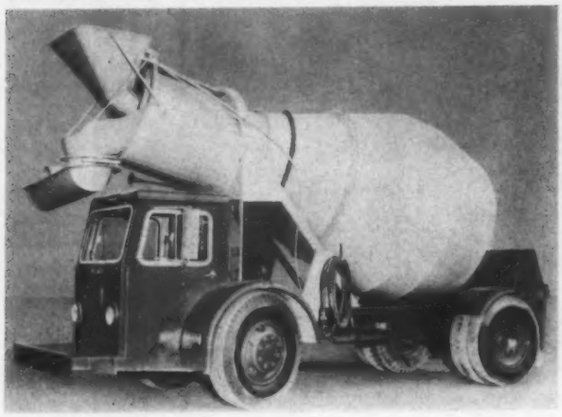
JOY CONSTRUCTION EQUIPMENT IS SOLD AND SERVICED BY THE JOY DISTRIBUTOR IN YOUR AREA

Portable Compressors | Trac Drills | Tungsten Carbide Rock Bits | Hand-Held Rock Drills

JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.
In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

For more facts, use Request Card at page 18 and circle No. 385



Front-end discharge of concrete is the major feature of this Willard 5-cubic-yard transit mixer.

Transit mixer features front-end discharge

The Willard Concrete Machinery Co. announces a transit mixer with a front-discharge design that makes it possible to drive the truck, cab-first, right onto the job site, unload to the front, and back out empty.

Additional features include shorter wheelbase and greater maneuverability, due to the elimination of a high-mounted water tank, and complete control by the driver in the cab. The truck engine operates the mixer.

The model now available has a 5-cubic-yard capacity.

For further information write to the Willard Concrete Machinery Co., Dept. C&E, 11700 Wright Road, Lynwood, Calif., or use the Request Card at page 18. Circle No. 99.

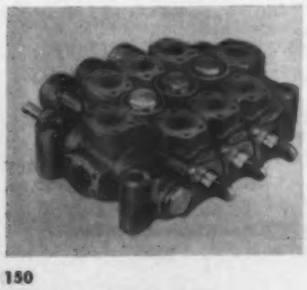
Multiplunger valves have wide application

Multiplunger, multiposition hydraulic valves, said to effectively crowd a maximum number of control functions into a minimum of valve space, are available from the Hydraulic Unit Specialties Co.

Offered in five basic model sizes, ranging from 3 to 185-gpm-capacity ratings, each Husco unit can be made to control up to six cylinders, single or double-acting, and to permit up to four positions of control.

The basic models of Husco hydraulic multiplunger valves are so designed that they can be easily adapted to an exceptionally wide variety of applications.

For further information write to the Hydraulic Unit Specialties Co., Dept. C&E, P. O. Box 257-E, Waukesha, Wis., or use the Request Card at page 18. Circle No. 22.



Four new blades available for big crawler tractor

Four specially designed blades are available for use with the new International TD-25 diesel crawler tractor.

The direct-lift hydraulic bulldozer blade and the direct-lift cable bulldozer blade, with cutting edges of heat-treated, high-carbon steel, have a heavy-duty, arc-welded, box-framed, moldboard construction. Tilt is easily adjustable to 18 inches between blade ends, and there is a maximum pitch adjustment of 10 degrees.

Weight of the hydraulic bulldozer blade is 8,720 pounds; of the cable model, 7,950 pounds. Blade length is 12 feet 3¾ inches. Height is [illegible] inches.

The direct-lift hydraulic Bull-grader and direct-lift cable Bull-grader blades also have cutting edges of heat-treated, high-carbon steel and the same construction as the dozer blades.

Bullgrader blades are easily angled from straight to 25 degrees right or left, and tilt is quickly adjustable to 12 inches between blade ends.

Weight of the hydraulic Bullgrader blade is 9,500 pounds, with the cable Bullgrader blade registering 9,[illegible] pounds. Blade length is 14 feet 4½ inches for the hydraulic model, and

Gar Wood - St. Paul truck equipment outperforms in every way that adds up to more job profits...smoother, more efficient operation... longer, trouble-free service ...faster, easier maintenance. Since dependable, economical performance is a primary requirement for the profitable operation of your business, why settle for anything less than the finest truck equipment you can buy?

It's the most advanced and complete line of arm-type, front-mounted and under-body-mounted telescopic hoists with precision hydraulic systems for smooth, controlled dumping. Matching bodies, with exclusive built-in strength features, are available for every hauling need.

Your nearby Gar Wood - St. Paul distribuor, a specialist in service and specifications, can demonstrate why you can be sure of trouble-free dependability when you insist on Gar Wood - St. Paul truck equipment.

14 feet 4½ inches for the cable version. Height of the blade is 44 inches.

For further information write to the International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago, Ill., or use the Request Card at page 18. Circle No. 66.

Announce concrete cart with 1,500-pound capacity

The Aeroil Products Co., Inc., announces the Model BG-10 "walk-behind" type of power buggy featuring 4-wheel stability and a payload capacity of 1,500 pounds.

The new model continues to use the dead-man brake, which automatically brings the unit to a complete stop when the operator releases the right-hand lever.

The Aeroil Model BG-10 power buggy is offered with a 10-cubic-foot concrete bucket.

An improved aircraft type of clutch cable is featured, and the wheelbase has been moved forward for greater stability and balance.

Forward and reverse transmission is standard equipment, and is accomplished through a hand-shift lever. The buggy is powered by a 7-hp gasoline engine.

Units are available with the standard 10-cubic-foot concrete bucket or with a flat pallet that can be used for hauling brick, block, boxes, and other materials. Over-all width is 31 inches, and loading height is 37 inches.

For further information write to the Aeroil Products Co., Inc., Dept. C&E, 19 Wesley St., South Hackensack, N. J., or use the Request Card at page 18. Circle No. 36.

McKiernan-Terry's Model DE-40 diesel pile hammer is said to be practical for all pile driving and especially suited for driving large concrete, pipe, and H-beam piles.

Big diesel pile hammer handles any type of job

A new diesel pile hammer delivering a mean energy of 24,000 foot-pounds per blow has been added to the McKiernan-Terry line.

Designated Model DE-40, the unit contains a 4,000-pound ram, operates at 48 to 52 blows per minute, and weighs 11,350 pounds fully equipped for operation.

The DE-40 hammer is completely self-contained, requiring neither boiler nor air compressor. A built-in fuel-oil tank holds 19 gallons of diesel fuel. According to the company, three gallons of fuel is consumed per hour of normal pile-driving operation.

Utilizing metered, liquid-fuel feed and impact automization, the DE-40 features automatically timed firing, requiring no pressure injection or automization components, and eliminating timing mechanisms and electric circuits.

The new hammer mounts in standard American pile-hammer leads and is hoisted and operated by a single load line. Compensating anvil loading improves firing capabilities when abnormal "pile fall" occurs.

A smooth, projection-free, outer hammer surface facilitates handling and prevents damaging hammer components during transport and by lifted pile. A cushion mounting isolates the working parts from shock of impact blow. An abrasive-resistant plating prevents galling and pickup in the cylinder bore.

The Model DE-40 is said to be practical for all pile driving and especially suited for driving large concrete, pipe, and H-beam piles.

For further information write to the McKiernan-Terry Corp., Pile Hammer Division, Dept. C&E, 100 Richards Ave., Dover, N. J., or use the Request Card at page 18. Circle No. 100.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

GAR WOOD-BUCKEYE DITCHERS give you advanced "extras" at no extra cost. Standard equipment on ladder-type ditchers includes the exclusive Hi-Lo traction shift that permits forward or reverse digging speed to be instantly increased or reduced 50% without disengaging main engine clutch.

GAR WOOD TRUCK CRANES have all the high-performance features to do more kinds of jobs... faster... more accurate... at lower cost. Modern, 3-shaft machinery design, arranged pyramid fashion, permits complete accessibility to every gear, drum, brake or clutch... allows quicker adjustments, faster conversions, easier maintenance.

AR WOOD TRACTOR EQUIPMENT, matched to rugged Euclid ctors, is engineered for trouble-free performance under the biggest ds. Equipment includes front- and rear-mounted cable control e, Tipdozers, Dozecasters and Rippers.

GarWood
INDUSTRIES, INC.
Wayne, Michigan • Richmond, California

For more facts, use Request Card at page 18 and circle No. 586

New tool available for scaling concrete

The Stow Mfg. Co. announces a tool designed with special cutting teeth for scaling concrete.

The three rows of teeth on this tool are rotated in such a way that each individual hardened tooth, instead of cutting in, actually strikes the surface a blow, thus chipping away the surface. The tool attaches to a Stow flexible shaft machine and operates at 3,400 rpm.

For further information write to Stow Mfg. Co., Dept. C&E, 40 Shear St., Binghamton, N. Y., or use the Request Card that is bound in at page 18. Circle No. 97.

The Ruemelin portable sandblast generator produces a high-velocity abrasive stream for pressure-blasting requirements.

Sandblast generator mounted on rubber tires

A high-velocity portable sandblast generator for use in concrete-block and concrete-mixing plants, as well as for such jobs as cleaning bridges and roadway markers, is offered by the Ruemelin Co.

Control valves provide fine adjustment of flow for any type of abrasive. By the simple movement of a lever, the abrasive can be regulated for density of mixture, nozzle opening, or size of abrasive used.

A special stopper valve starts or stops the blast without exhausting compressed air from the tank. It stops both sand and air instantly without the sand lever being adjusted.

For ease of handling, Ruemelin portable blast generators can be mounted on 24-inch steel or 16-inch rubber-tire wheels. Two or 4-wheel mounts are furnished as desired.

Optional equipment includes remote controls that permit the operator to stop and start the abrasive stream at the nozzle without going back to controls on the machine.

Ruemelin portable blast generators range from 300 to 2,000 pounds.

For further information write to the Ruemelin Mfg. Co., Dept. C&E, 3862-L N. Palmer St., Milwaukee 12, Wis., or use the Request Card at page 18. Circle No. 63.

Announce unique system for driving tunnel raises

Considered well suited to work in tunnel construction, the Allmek Raise-Climber provides a fully self-contained elevating system for driving raises from 40 feet up to 1,200 feet or more.

The Swedish-designed unit consists

Gives a Man Giant Strength

CM PULLER

- SMALL — Lever is only 20½" long.
- POWERFUL — 83 lbs. on lever* produces 3,000 lbs. at hooks. *1½ ton model.
- VERSATILE — "CM-Alloy" flexible welded chain. Lifts or pulls at any angle.
- PORTABLE — Made of aluminum alloy. ¾ ton model weighs only 14 lbs. Capacities ¾ to 6 tons.

A NATURAL FOR CONSTRUCTION WORK! The "CM" Puller will do a "thousand-and-one" jobs for you. It will do them faster, safer and far easier. The "puller" is compact... stores conveniently in a tool box. Lifetime lubricated. Every contractor should have one.

CM HOISTS

SEND FOR "CM" PULLER BULLETIN 146 AND NAME OF YOUR LOCAL DISTRIBUTOR.

CHISHOLM-MOORE HOIST DIVISION
COLUMBUS McKINNON CHAIN CORPORATION
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REGIONAL OFFICES: NEW YORK, CHICAGO, CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ont.

For more facts, circle No. 387

Re-power your service-worn WISCONSIN ENGINES with WISCONSIN factory parts from your nearby Authorized Service Station!

Because all Wisconsin Engines are built to highest quality standards and exacting engineering specifications, it pays to use only factory-approved parts. Wisconsin factory parts now include the new TRI-CROME® re-ring sets — factory-engineered and built to Wisconsin Engine specifications. Rings are made to exact psi requirements. They are pre-seated to provide light-tight fit for full compression and oil control along the entire piston travel. Full-chrome plating protects rings and cylinder walls by resisting scuffing, abrasion, and scoring — extends ring and engine life. What's more, you get *three* full-chrome rings for the price of competitive sets with only *one* or *two!*

All Wisconsin factory-engineered parts are built to original Wisconsin Engine specifications and quality. Connecting rods; crankshafts; pistons; valves; governor, fuel-pump, and other parts—even gaskets—are precision-tailored for specific engines. The result: *like-new* power that keeps your Wisconsin-powered equipment at peak efficiency.

You save time and cost because Wisconsin parts for all models are quickly and conveniently available from approximately 2000 Authorized Wisconsin Service Stations *directly* — or supplied by these Service Stations to independent repair shops and original-equipment dealers everywhere.

Send coupon for details.

WISCONSIN MOTOR CORPORATION
Dept. C-20, Milwaukee 46, Wisconsin
PLEASE SEND ME
☐ Service Station Directory S-198 and Service Bulletin S-261.
Name.....
Company.....
Address.....

For more facts, use coupon or Request Card at page 18 and circle No. 388

SPEED CONSTRUCTION JOBS

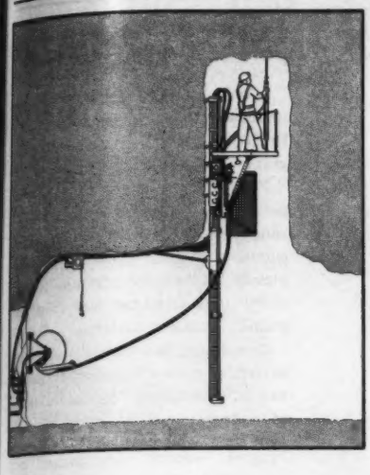
SWENSON SPREADERS FOR Sealcoating SAVE...

✓MEN ✓MONEY ✓MACHINES

Swenson Spreaders spread salt, calcium chloride, sand, gravel, cinders, or any combination of these materials in any quantity desired . . . in narrow strips or full traffic lanes. Clutch-controlled flow for steady or intermittent spreading. Operates at speeds up to 30 M.P.H. — forward or reverse. Swenson Spreaders are available in various sizes to fit any dump truck box. Fewer trucks, fewer men and less material are needed to spread a given area. This year trim your construction costs with Swenson Spreaders. Write us today!

SWENSON SPREADER & MANUFACTURING CO.
LINDENWOOD, ILLINOIS

For more facts, circle No. 389



The Raise-Climber runs along the guide rail, which is fastened to the rock with expansion bolts. Air and water hoses are brought up to the intake part of the guide rail from a remote-controlled valve station.

of an easily portable all-steel elevator that climbs a rack-equipped guide rail. The operator is thus raised to the working face that is to be drilled for the insertion of charges. The platform is then lowered for blasting, cleaning out, and ventilating, after which the operator re-ascends to fit another 3 or 6-foot section for the next drill-blast cycle.

The four services housed in the rail section—air, water, electricity, and telephone—are handled by a single operator.

For further information write to the Alimak Corp., Dept. C&E, 306 Avila St., San Francisco 23, Calif., or use the Request Card at page 18. Circle No. 11.

Crawler-mounted crane has 30-ton capacity

The Model 330 Sprawler, a crawler-mounted crane equipped with pivoting outriggers and able to lift more than its own weight, is announced by the Koehring Division of the Koehring Co.

With the outriggers set, the Model 330 can lift 60,000 pounds, working with a 30-foot boom at a 12-foot radius. With the outriggers folded against the crawlers, the new crane will lift and carry 47,980 pounds with a 30-foot boom at a 10-foot radius.

For further information write to the Koehring Division, Koehring Co., Dept. C&E, 3026 W. Concordia Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 44.

The Model 330 Sprawler is designed to combine high lifting capacity with ease of transportation.

CURE CONCRETE IN THREE DAYS!

Now! Cut curing time a full week . . . use FULCO CURING MATS! They use less water . . . stay wetter longer . . . increase compressive strength of concrete . . . insulate against severe temperature changes . . . produce a more uniform job! Fulco Cotton and Burlap curing mats may be re-used again and again. Write for complete information and prices.

FULTEX® AND SHUREDRY® TARPS
FOR EVERY CONSTRUCTION JOB.
Buy direct from Fulton and save. Standard sizes and weights in stock for shipment—or made to your specifications. Also nylon tarps. Write for prices.

Fulton
COTTON MILLS

P. O. Box 1726, Atlanta 1, Georgia
Telephone MUrray 8-1111 TWX: AT 24

For more facts, use Request Card at page 18 and circle No. 390

Digs and stacks 2,000 yds. an hour at "impossible" speeds...on 349 Timken® bearings

Weighing in at 2½ million lbs., this giant Bucyrus-Erie wheel excavator knocks out previous records for this type of equipment. It can dig and stack 2,000 yds. of over-burden an hour. And the stacker conveyor belt speed—1,000 fpm—was believed impossible to achieve for this type of service.

To take the extreme loads on the main wheel drive—heart of the machine—Bucyrus-Erie uses three Timken® double row tapered roller bearings. Two more are on the conveyor drive. And 344 Timken bearings roll the loads at other critical points. Timken bearings work better because . . .

1) *They take all loads.* Their taper lets Timken bearings take all radial and thrust loads. And full-line contact between rollers and races provides extra load-carrying capacity when needed.

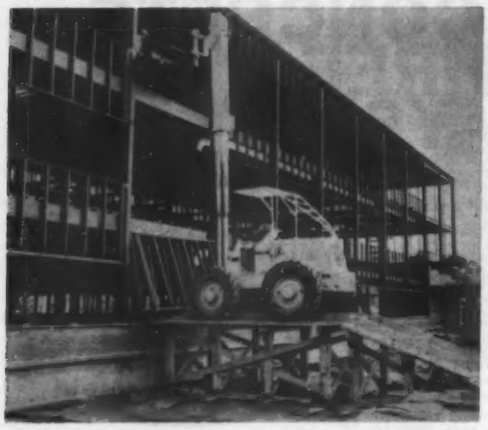
2) *They practically eliminate friction, reduce maintenance.* Timken bearings are geometrically designed and precision-manufactured to roll true. And because they hold shafts concentric with their housings, Timken bearings make closures more effective in keeping lubricant in, dirt out, maintenance down.

Also, you get the *extra* advantages of Timken Company leadership such as service from graduate engineer salesmen qualified to work directly with your purchasing, engineering and production people. Service backed up by advanced research and testing facilities unique in the bearing industry.

When you buy Timken bearings you get . . . *1) Quality you can take for granted. 2) Service you can't get anywhere else. 3) The best-known name in bearings. 4) The pace setter in lower bearing costs.* The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.*

BETTER-NESS rolls on
TIMKEN®
tapered roller bearings

For more facts, use Request Card at page 18 and circle No. 391



During construction of a school near Syracuse, N. Y., the contractor, John G. Alibrandi Construction Corp. of Syracuse, was faced with the problem of hoisting ribbed steel flooring to the third-floor level of the building, 28 feet above grade. The problem was solved by using a wooden platform and a 4-wheel-drive Kwik-Mix Hi-Lifter. Combined with the 22½-foot lift of the Hi-Lifter, the 6-foot-high platform gave plenty of elevation for the job. Since that time, a pallet-fork attachment, which will place a load at a height of 35 feet without the aid of a ramp, has been made available for the Hi-Lifter. The rig reportedly can travel at speeds up to 18 mph, lift up to 6,000 pounds, and climb a 70 per cent grade fully loaded. For further information write to the Kwik-Mix Co., Dept. C&E, 235 W. Grand Ave., Port Washington, Wis., or use the Request Card at page 18. Circle No. 15.

Two-way radio system part of wearing apparel

A new 2-way personal radio communications system is announced by the Seiscor Division of the Seismograph Service Corp.

Featuring light weight and complete portability, it is a limited range system for person-to-person communications, utilizing a completely transistorized transmitter-receiver unit weighing less than one pound, including batteries.

One model has the radio unit and batteries, noise-canceling earphone and built-in antenna as integral parts of a special plastic safety helmet with an attached noise-canceling

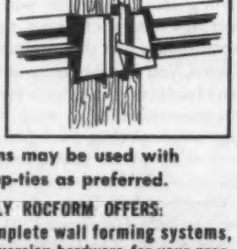
To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card at page 18.

ROCFORM
Adapt-A-Clamp system
touches all the BASES!

INSTITUTIONAL
COMMERCIAL
INDUSTRIAL
RESIDENTIAL

Never before has there been a concrete form hardware system that is so practical . . . so simple. And because of its simplicity, concrete and general contractors on all types of wall work can convert their existing forms and pay for them with increased operating efficiency.

- Faster Set-up Time
- Faster Stripping Time
- Longer Form Life • Clean, True No-Seam Walls



Adapt-a-Clamp Systems may be used with re-usable rods or snap-ties as preferred.

READY-MIX MEN!
There are plus profits in form rentals. Rocform has the plan . . .
WRITE TODAY FOR FULL DETAILS

ONLY ROCFORM OFFERS:
Complete wall forming systems, conversion hardware for your present panels backed by on-the-job technical assistance, an iron-clad guarantee of satisfaction.
Get full details on financial planning that really counts!
LEASE-PURCHASE
OUTRIGHT PURCHASE

ROCFORM CORPORATION
15160 W. EIGHT MILE ROAD • DETROIT 35, MICH.

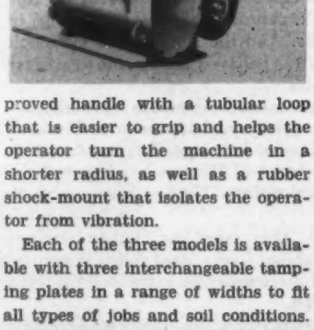
For more facts, circle No. 392

Improved line of tampers offered in three models

The J. Leukart Machine Co.'s new Jay tampers are offered in three models—the J-13, J-18, and J-36.

According to the firm, tamping force has been increased as much as 50 per cent and travel speed as much as 100 per cent, with resulting ability to compact as much as 100 cubic yards of earth per hour in 6-inch lifts. In addition, a new plate contour promises faster, better tamping in heavy soils.

For easier handling and control, the new Jay tampers also feature an improved handle with a tubular loop that is easier to grip and helps the operator turn the machine in a shorter radius, as well as a rubber shock-mount that isolates the operator from vibration.



Each of the three models is available with three interchangeable tamping plates in a range of widths to fit all types of jobs and soil conditions.

All models are equipped with Wisconsin Model BKN 4-cycle engines of 6.8 horsepower at 3,600 rpm, or equivalent, and they are said to offer compacting force equal to that of a 10-ton roller.

For further information write to the J. Leukart Machine Co., Jay Division, Dept. C&E, 2222 S. Third St., Columbus 7, Ohio, or use the Request Card at page 18. Circle No. 91.

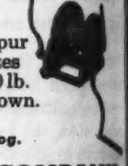
SEE Sasgen FOR CONTRACTORS' DERRICKS • HOISTS • WINCHES

- Easily rigged on the job
- Conservatively rated for safety
- Simple in design, easily maintained.

ROOFERS' CIRCLE SWING DERRICKS
360° operation. 500 to 2500 lb. capacities. Optional type of power. Champion electric shown.

CONTRACTORS' HOISTS
Single or double drum types with capacities from 500 to 5500 lb. single line pull. Optional type of power.

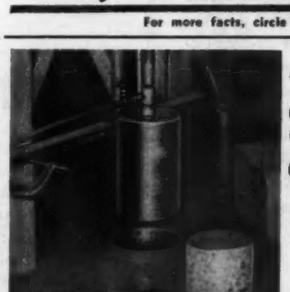
Hand-Powered WINCHES
Safe worm or spur gear design. Sizes for 400 to 40,000 lb. load. No. 110 shown.



Write for latest catalog.

Sasgen DERRICK COMPANY
3127 GRAND AVENUE CHICAGO 22, ILLINOIS

For more facts, circle No. 393



Coring in steel reinforced concrete floor

You Can Save On Drilling Time and Costs With
HOFFMAN Thin-Wall DIAMOND BITS

Hoffman Thin-Wall Bits are engineered for the specific job . . . assure you of faster, smoother coring on any test . . . regardless of material. Produce amazing time and cost-saving results drilling reinforced concrete, tile, asphalt, etc., because drilling speeds are predetermined. Hoffman tests the material to be drilled before designing your bits . . . there's no guesswork about performance.

Hoffman Thin-Wall Bits are Diamond Impregnated or Surface Set as required.

Write for literature. Ask about FREE Test of Your Material

HOFFMAN BROS. DRILLING CO.
Box 426 • PUNXSUTAWNEY, PA.

For more facts, circle No. 394

hand microphone. Another model provides a noise-canceling headset with a built-on antenna and noise-canceling microphone, with the unit and batteries in a compact belt pack. Two other standard models are similar to those described, but with standard earphones and microphones.

Features of the system include a fully transistorized industrial-type printed circuit with crystal-controlled transmitter and superheterodyne receiver, providing a full 750 milliwatts of usable audio power. The batteries are said to have an exceptionally long life.

The units are available for use in 27 or 42-megacycle operations, with the 27-megacycle units not requiring a license of any kind. Other frequencies are available on special order.

For further information write to the Seiscor Division, Seismograph Service Corp., Dept. C&E, Box 1590, Tulsa, Okla., or use the Request Card at page 18. Circle No. 73.

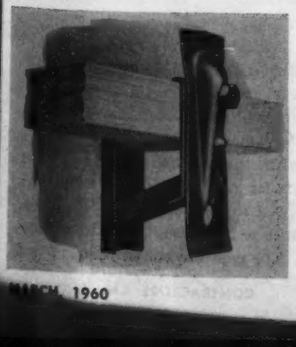
New snap-tie holder for forms without studs

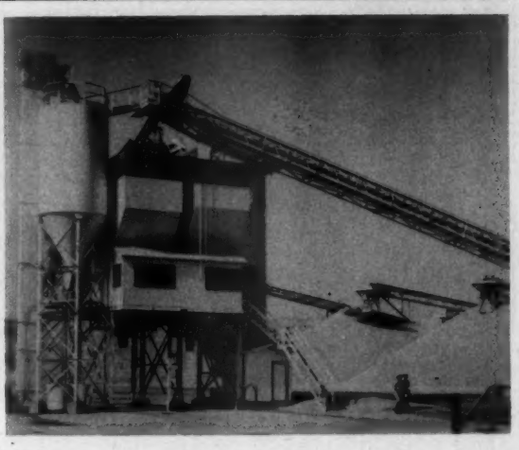
Superior Concrete Accessories, Inc., announces a snap-tie holder for use with ¾-inch plywood sheathing where single liners only are applied.

Although it is designed for use with single liners on forms without studs, this holder may also be applied to vertical studs on forms where wales are not used.

In application, the opposing holes are drilled in the plywood and the snap ties inserted. When the liner is brought into place, this tie holder secures the ties and supports the liner. No nailing is necessary.

For further information write to Superior Concrete Accessories, Inc., Dept. C&E, 9301 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 3.





A modern, highly efficient concrete batching facility, consisting of two Noble plants erected side by side with twin driveways and charged by a single aggregate conveyor, is part of a new installation of the Southern Pacific Milling Co. at El Rio, Calif. With routine output in excess of 180 cubic yards per hour, the plant charges from 15 to 19 mixer trucks operating in a radius of 25 miles. For further information write to the **Noble Co.**, Dept. C&E, 1860 Seventh St., Oakland, Calif., or use the Request Card at page 18. Circle No. 43.

GALION®
Vibratory Compaction...
UNITS

With the GALION 3-WHEEL ROLLER VIBRATORY COMPACTOR combination, you not only attain specified densities of granular materials, but you also can achieve effective compaction of the many soils which respond best to a static weight roller. In addition, the 3-Wheel Roller can be used for the compaction of finish surface materials. This multi-purpose usage multiplies the profit possibilities on your roller investment.

●

With the GALION Model 503 GRADER-VIBRATORY COMPACTOR combination it is possible to spread, level, and compact the material — all in ONE operation or separately as the situation may demand. The vibrating unit is raised hydraulically for speedy travel on, to and from the job. The profit possibilities of this combination are not limited to one function. Vibrating Compactor unit is easily removed to permit other grader operations such as ditching, blading, windrowing, etc.

With the GALION Grader or Roller and Vibratory Compactor combination you SAVE — on equipment cost, labor costs, operating costs and overhead costs.

doubly useful- doubly profitable

ELECTRIC VIBRATORY COMPACTOR FEATURES

- **Delivers up to 4200 three-ton, deep-penetrating compacting blows per minute.**
- **Vibratory Compactor can be operated with Roller or Grader traveling forward or reverse.**
- **Compacted surface is smooth and flat—no waves or "washboard" effect.**
- **Roller and Grader are protected against vibration of the compactors which FLOAT on the surface.**
- **Power unit (engine and generator) for compactor can be used as an emergency lighting plant or for the operation of small power tools.**
- **Individual compactor shoes can be detached and fitted with operating handle for compacting confined spots others can't reach.**

THE GALION IRON WORKS & MFG. CO.
General and Export Offices
Galion, Ohio, U.S.A.
Cable Address—GALIONIRON, Galion, Ohio

GALION® ESTABLISHED 1907 **MOTOR GRADERS • ROLLERS**
VIBRATORY COMPACTORS • PNEUMATIC TIRE ROLLERS

THE GALION IRON WORKS & MFG. CO. Date_____
Dept. CE-30 Galion, Ohio
Please send me complete information on ☐ 3-Wheel Roller with Vibrator ☐ Model 503 Grader with Vibrator
Name_____ Title_____
Firm or Dept. _____
Street_____ City_____ State_____

For more facts, use coupon or Request Card at page 18 and circle No. 395

Ready-mix trucks supply machinery that pours concrete pipe in a continuous process. The method uses a Goodyear-built inflatable inner form and a mobile outer form.

Lay concrete pipe up to 12 fpm with new process

Construction machinery that builds concrete pipe in a freshly cut ditch at a rate of 8 to 12 fpm is announced by the Fullerform Continuous Pipe Corp.

According to the company, this equipment eliminates joints and seams, and cuts construction time and over-all costs.

Inflatable rubber and fabric forms, designed by the Goodyear Aircraft Corp., are part of the continuous-operation system: using two 300-foot inflated forms with only 3 psi of air pressure, as much as 600 feet of concrete pipe can be poured at a time without interruption. It is possible to line up forms for runs in miles. Ready-mix concrete trucks are used in a continuous stream to supply the pouring equipment.

The construction process consists mainly of a double-hoppered forming machine that is pulled along the rounded bottom of a ditch, while enveloping an inflated inner form.

The inflatable inner form is picked up by the outer form so that tamping devices can "tuck" concrete under it. Half of the double hopper, activated by electrically driven tampers, shoves concrete into the bottom of the ditch while the other half is forming the top of the pipe.

The hoselike inflatable form is open at both ends to hold airtight bulkheads through which air pressure is applied for strength.

The inflatable form is said to be easy to handle. It can be deflated for extraction about two hours after the concrete has been placed.

Machinery containing the outside form for concrete pipe is set in the ditch, and one end of the inflatable form is passed through it with bulkheads at both ends. When air pressure of the inner form is three pounds, the pipe-laying process is ready to begin.

As concrete is fed into the machine's double-hopper, the forming machine is drawn forward by a cable on a winch. An electric motor on top of the machine operates the tamping devices that distribute concrete uniformly and tightly around the inner form.

Fuller has developed inflatable forms in lengths from 50 to 300 feet and reportedly has laid pipe from 12 to 48 inches in diameter.

For further information write to the Fullerform Continuous Pipe Corp., Dept. C&E, Phoenix, Ariz., or use the card at page 18. Circle No. 78.

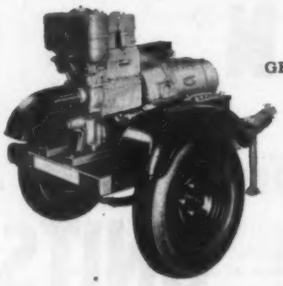
New scraper available for line of graders

The Martin Co. offers a new 3½-yard (heaped) scraper unit to be mounted on Caterpillar motor graders.

Called GraderscrapeR, the unit is mounted in place of blade and circle on No. 112, 12, and 14 motor graders. It utilizes grader power and existing connecting points, permitting fast loading and unloading of most materials.

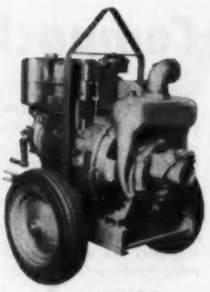
Mounted on the circle lift arms of the grader, the GraderscrapeR utilizes full power of the grader tandem drive. It can be loaded without pushing. Once loaded, it can be lifted up with the mechanical drive of the grader and carried at full highway speed to the dump area. Road clearance is 11 inches for a loaded unit.

The new unit can be tilted up to 1[illegible]



GENERATOR

— to rental equipment suppliers to investigate low-cost, high profit, dependable operation of AIR-COOLED DIESELS —by Lister



PUMPS

MODEL SL3

COMPRESSORS

An adaptation to meet every requirement 3½ to 36 BHP. Write for particulars to:

LISTER-BLACKSTONE, Inc.
42-32 21st Street, Long Island City 1, N. Y. Tel. STillwell 6-8202
In Canada: Canadian Lister-Blackstone, Ltd., 1921 Eglinton Ave., E., Toronto 13, Ontario
For more facts, use Request Card at page 18 and circle No. 396

ONLY
CROSBY-LAUGHLIN
SHACKLES
SAY WHAT THEY DO
DO WHAT THEY SAY!
Load-Rated®

GUARANTEED CAPACITIES
SIZE FOR SIZE—UNEQUALLED!

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FT. WAYNE, INDIANA
Forged fittings for wire rope and chain

INDUSTRIAL DISTRIBUTORS

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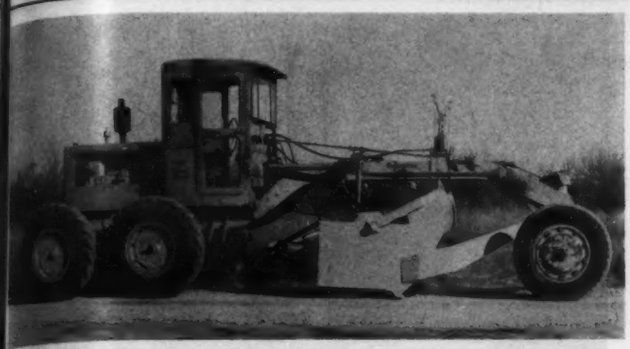


Operated by the grader controls, the GraderscrapeR mounts on the circle lift arms and uses full power of the grader tandem drive to load without pushing.

degrees to either side, to scrape ditch sides while the grader remains level, and it can be shifted to either side of the machine to cut 6 inches outside the grader wheels.

Hydraulic bulldozer-type ejection assures that sticky material can be dumped quickly. An apron opening of 19½ inches provides plenty of clearance for large chunks of earth or stone. Cutting width is 9 feet 6 inches.

For further information write to the Martin Co., Dept. C&E, 620 Andrews Ave., Kewanee, Ill., or use the card that is bound in at page 18. Circle No. 84.

Batch-plant feeder offered in two sizes

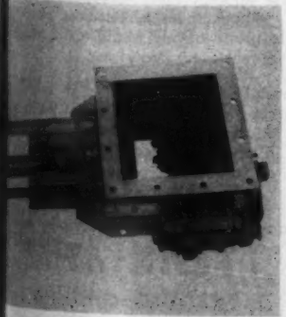
The Fairfield Engineering Co. announces the new Fair-Flo feeder for use with batch plants for feeding cement, lime, and other pulverized materials.

It features a 6-inch rotary serrated helix in the body of the feeder that prevents flooding through and reduces lumps. The helix is driven by an air motor and has an infinite number of speeds.

The cutoff gate is a slide plate actuated by an air cylinder. It closes in two stages, with the partially closed position infinitely adjustable for accurate cutoff.

The Fair-Flo Feeder is available in 9 and 14-inch sizes, and is adaptable to Fairfield batch plants.

For further information write to The Fairfield Engineering Co., Dept. C&E, 324 Barnhart St., Marion, Ohio, or use the Request Card at page 18. Circle No. 26.



The Fair-Flo feeder has a 6-inch rotary serrated helix that keeps materials from flooding through.

For more facts, circle No. 399→

Model 'CM' Holland Stake Puller

For all types of light and heavy construction

- Positive grip
- Tremendous leverage
- No stake mutilation

Does the work of three men — and in less time

Write for Literature

HOLLAND MFG. CO.

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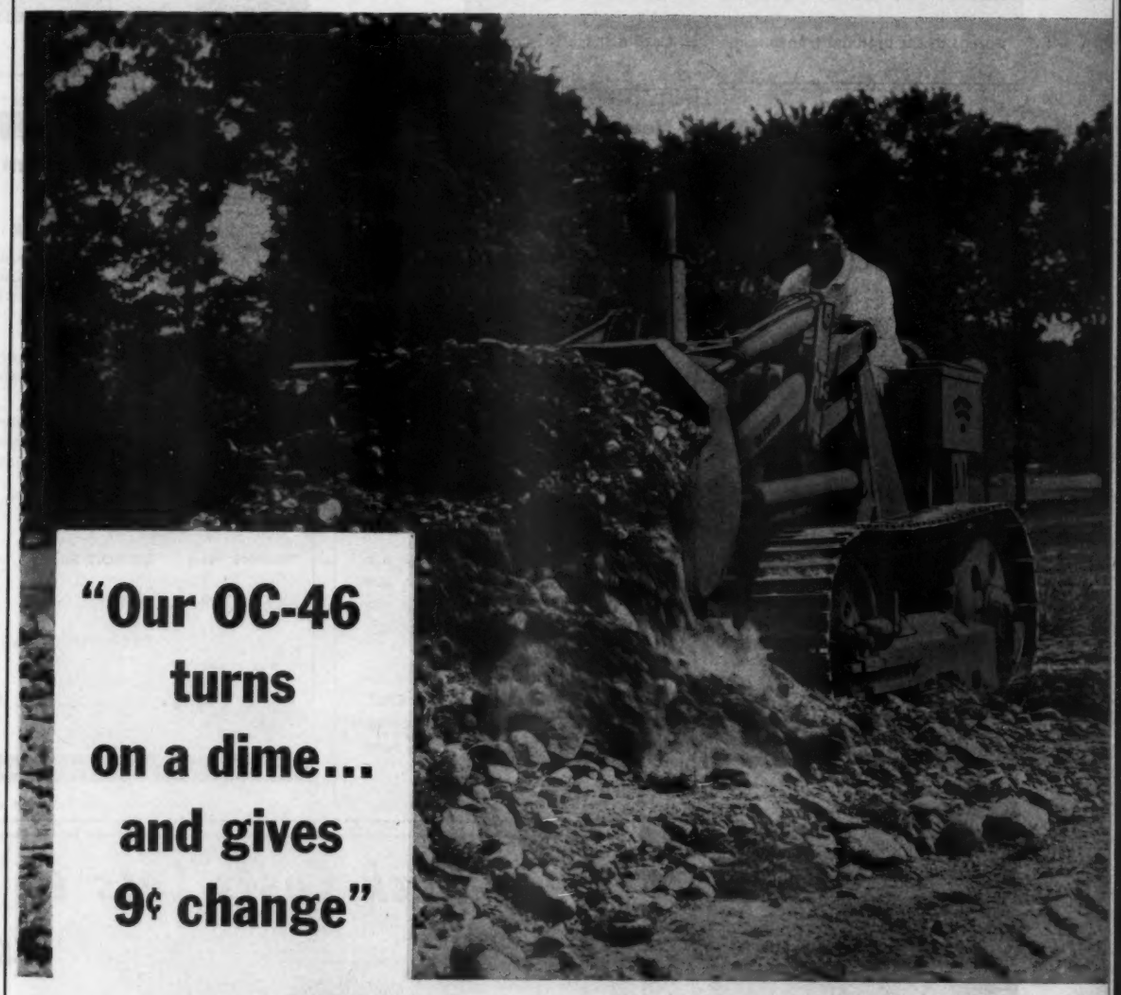
For more facts, use Request Card at page 18 and circle No. 398



"Our OC-46 turns on a dime... and gives 9¢ change"

Work-test an Oliver OC-46 loader...see how "Spot-Turn" steering eases all your work!

This Oliver OC-46 works and ranges over hundreds of acres—moving, grading, loading thousands of yards. It's one of six Oliver tractors owned by Baldwin Construction Company, Bloomfield, New Jersey.

Operator Nicholas Psiahas reports on its easy handling and maneuverability: "'Spot-Turn' steering is terrific—the OC-46 is so comfortable to operate. Controls are simple. Our OC-46 turns on a dime...and gives 9¢ change."

Simple operation with low-effort steering is just the start of the OC-46's benefits. This compact, easily transported, ⅝-yd. crawler loader is official champion of its class in *pounds-pull*—meaning greater *work power*. It has the shortest turn radius. A factory-built, *integrated* tractor-loader, the OC-46 has low-profile design with shorter pedestals for greater stability and work safety.

Get all the facts on the OC-46 loader. Choice of 30-plus h.p. gasoline or diesel engine.

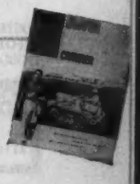
LOOK TO OLIVER FOR YOUR BEST BUY IN WHEEL AND CRAWLER TRACTORS

THE OLIVER CORPORATION

Dept. 2232, 400 W. Madison St., Chicago 6, Illinois

Most versatile, all-job crawler you can own Double the work scope of your OC-46. Add the quick-hitch (only three minutes) Oliver backhoe and handle trenching, excavating and loading jobs of all kinds. Fully hydraulic operation with deep 12'8" digging and high 9'6" loading. Full 180° boom swing. A perfect low-cost digging-loading package for towns, parks, contractors, etc.

Jobs, jobs, jobs—See how valuable the OC-46 can be in your operations. Review its many important features and job advantages in this big, 16-page catalog.



Increased lugging ability of the new D6 Series B tractor makes the 93-hp machine a high-production unit.

New tractor series has improved design

A new D6 Series B tractor, which incorporates major improvements resulting in greater machine and operator efficiency, is available from the Caterpillar Tractor Co.

Features include: a completely new, compact engine that gives the tractor 25 per cent greater lugging ability; two new hydraulic control units that are integrally mounted; a tilt cylinder for special applications; an optional transmission for jobs calling for higher drawbar pounds pull; and a redesigned operator's compartment.

Speeds of the optional transmission match tractor speed and drawbar pounds pull to those most desirable for towed implements in special applications. The optional forward speeds are: 1.9 mph in first gear; 2.8 mph in second gear; 3.4 mph in third gear; 4.3 mph in fourth gear; and 6 mph in fifth gear. Reverse speeds are: 2.4 mph in first gear; 3.4 mph in second gear; 4.1 mph in third gear; and 5.2 mph in fourth gear.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 32.

YOU CAN'T OUTGROW
A ROLCOR ROLLER
STATIC OR VIBRATORY

Whether your job is . . .
Crease rolling . . . Driveways . . . Parking lots . . . Patching . . . Tennis courts . . . Sod rolling . . . Maintenance . . . you won't outgrow the usefulness of a Rollpac.
That's why thousands of contractors, landscapers, institutions and others make Rollpac their "number one" unit. One week on *your* job will prove to you why Rollpac is the top selling one-ton roller in the United States.

Here's a two-ton vibratory roller that produces compaction to equal or exceed static rollers weighing eight tons! Vibrapac is 100% American designed and built specifically for asphalt and soil compaction—no corrugation of surfaces. A single lever clutch shifts from static to vibratory action. Works in close places.

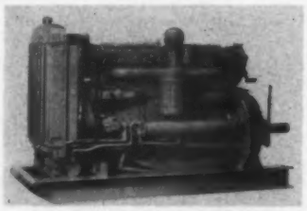
Easy to transport with Rolcor Trailer.

WRITE FOR FULL INFORMATION AND LITERATURE

ROSCO MANUFACTURING CO.
ROLCOR DIVISION
3118 Snelling Ave. • Minneapolis 6, Minn.

For more facts, circle No. 400

New diesel engines and generator sets



New diesel engines and power units are offered by the Murphy Diesel Co. in sizes up to 320 horsepower.

The Murphy Diesel Co. announces the MP Series of diesel engines and generator sets.

The engines and power units are available in sizes from 105 to 320 horsepower. The generator sets are offered in capacities from 60 to 188 kilowatts.

For further information write to the Murphy Diesel Co., Dept. C&E, 5317 W. Burnham St., Milwaukee 19, Wis., or use the Request Card at page 18. Circle No. 85.

Need HOSE in a HURRY?

Suction • Water • Steam
Air • Multi-Purpose
Discharge • Pile Driver

Wherever your job is—*whenever* you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—*when* and *where* you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

BALTIMORE, Md.	CLEVELAND, Ohio
BOSTON, Mass.	DETROIT, Mich.
CHICAGO, Ill.	MEMPHIS, Tenn.
	PHILADELPHIA, Pa.
FIND US FAST IN THE YELLOW PAGES	ST. LOUIS, Mo.

Continental Suction Hose is recognized nationally by contractors for its superior quality—not an ordinary hose, but a hose built for rugged, dependable service. Sizes 1½" through 12", for water and/or sand suction. Send for catalog of HOSE and PROTECTIVE CLOTHING.

HOSE by CONTINENTAL

CONTINENTAL RUBBER WORKS • 1989 LIBERTY ST. • ERIE 6 • PENNSYLVANIA

For more facts, use Request Card at page 18 and circle No. 401

Power-Pack Costs Less to Own and Less to Operate

Now you can speed all of your road widening, shoulder and trench-filling operations with the multi-purpose Power-Pack. This versatile machine can be attached to any standard single or tandem axle truck in 90 seconds or less—no special tools are required. One operator, using the simple lever controls, can unload up to 200 tons of sand, gravel or aggregate per hour, placing the material accurately without spillage. Shoulder material can be spread to grade at any width from 2 to 3 feet at a rate of 1,000 feet every hour.

Power-Packs are equipped with aircraft type swivel wheels and detachable tow bar to permit fast job-to-job moves without disassembly or trailer equipment. There's no time lost in loading or unloading and within minutes after arrival on the job site Power-Pack is ready to go to work.

See your dealer today or write direct for complete information on how Power-Pack can cut costs and speed up your job.

POWER-PACK CONVEYOR CO.
936 E. 140th St. - GLenville 1-7670 - CLEVELAND 10, OHIO

Dealer franchise available in some areas.

For more facts, use Request Card at page 18 and circle No. 402

For further information on any product described in this section circle the indicated number on the Request Card at page 18.

Plastic safety hats have snap-in suspension

The Davis Emergency Equipment Co., Inc., announces the availability of injection-molded, all-plastic safety hats and caps.

Lightweight and with no metal parts, the new Dielectric Hedgard

hats and caps reportedly are strong enough to withstand repeated impacts of 40 foot-pounds. Molded lugs on the brim permit the attachment of chin straps.

These hats utilize a plastic snap-in suspension that holds the hat securely by gripping low on the back of the head. Snap-in suspension permits adjustment for head sizes 6½ to 7¾, as well as adjustment on either side for added comfort. The feature also permits easy cleaning or sterilization and replacement of leather or leatherette sweatband.

For further information write to the Safety Equipment Division, Davis Emergency Equipment Co. Inc., Dept. C&E, 45 Halleck St., Newark 4, N. J., or use the Request Card at page 18. Circle No. 131.

FOUNDATION CONSTRUCTION

CAISSONS

DRILLED AND UNDERREAMED

PIERS

SPECIAL DRILLING PROBLEMS

Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C., Cleveland, Ohio

Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

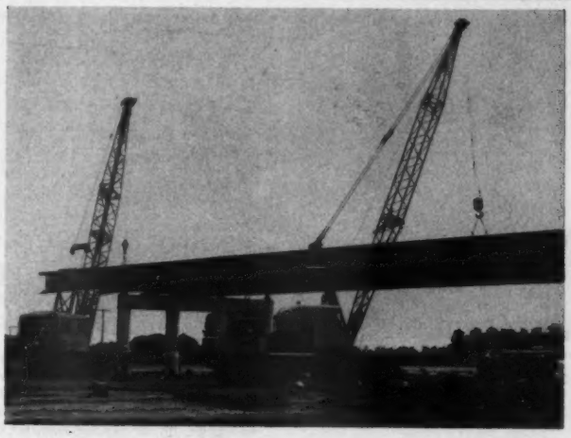
McKINNEY DRILLING COMPANY

HACOGDOCHES, TEXAS

Ph.: LOgan 4-8373 • P. O. Box 190

For more facts, circle No. 403

To place a 65-foot-long 30-ton steel girder on an overpass for the new Ohio State Route 1, in Ashland County, the Maxon Construction Co., Dayton, uses its 35-ton MC-530W Moto-Crane with a 55-foot boom, as well as an older Lorain crawler crane. The bridge is 350 feet long, 32 feet wide, and contains 300 tons of structural steel. For further information write to **The Thew Shovel Co.**, Dept. C&E, 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 132.



HYSTER

Lowest compaction cost per yard—

HYSTER® has it!

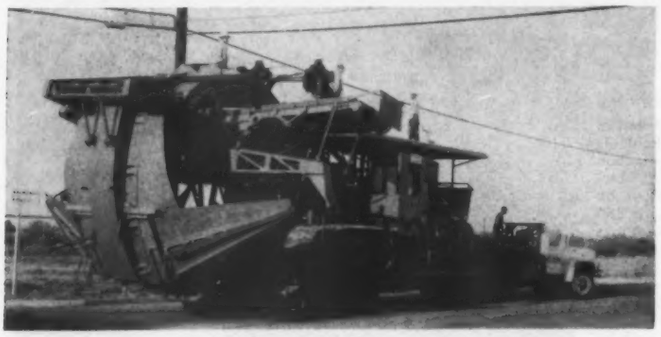
HYSTER DW20A Compacters give you a new competitive advantage. First, these high-speed machines cut costs to as low as 3c per yard. Second, spreading production is no longer limited by slow rolling methods.

Call your Caterpillar-Hyster dealer for on-the-job performance facts.

TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. • Nijmegen, The Netherlands • Glasgow, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

HYSTER COMPANY
TRACTOR EQUIPMENT DIVISION
P. O. Box 328 • Peoria, Illinois

For more facts, use Request card at page 18 and circle No. 404



To solve loading and hauling problems for this Gar-Wood Model 330 Buckeye 128,000-pound ditcher (rated at 28 cubic yards per minute), the Martin Trailer Division of Hyster Co. built a unique 4-axle 16-wheel unit with capacity to move the machine over ordinary highways without causing pavement damage. The Martin Model RF8TL-4 trailer is of folding gooseneck design, 38 feet long and 12 feet wide. For loading and unloading, the trailer's gooseneck lowers into a loading ramp that allows the huge ditching rig to be walked directly onto the platform. In spite of the unit's size, it can be loaded and ready for the road in 20 minutes. For further information write to the **Martin Trailer Division, Hyster Co.**, Dept. C&E, 620 Andrews Ave., Kewanee, Ill., or use the Request Card at page 18. Circle No. 106.

LOW COST...EASY OPERATION

Rivinius

LIVE POWER STEERING

for CAT D8 Tractors

(prior to 14A models)

SAVES MAN-POWER: Operator fatigue goes down... performance goes up! Finger tip control Live Power Steering provides closer, faster control of D8 power and maneuverability.

SAVES CLUTCHES: No wasteful slippage and clutch wear...on each turn the clutches are engaged smoothly into complete seizure.

SAVES TIME: Levers move only 1½" and return automatically when released. Operators report they can operate a D8 one, sometimes two speeds faster with Rivinius Live Power Steering.

SAVES DOLLARS: This new Rivinius system is compact, easy to install on D8's in the field...consists of hydraulic cylinder, valve, pump, reservoir, brackets and hardware.

See your Caterpillar dealer now...or write:

Rivinius, inc.

EUREKA, ILLINOIS

For Caterpillar Motor Graders: Torque Steering Booster ...Hydraulic Moldboard Shift...Snow Blower...Snow Loader
For Caterpillar D8 Tractors: Live Power Steering

For more facts, use Request Card at page 18 and circle No. 405

"Hardrock Smitty" says:— **IT TAKES A SMITH 125 AIR COMPRESSOR TO DELIVER ON THE TOUGH JOBS . . .**

Built to "take it" when the going get tough, the Smith 125 Air Compressor will give you years of low cost, dependable service. The Rugged Hercules Industrial engine delivers over 125 c.f.m. hour after hour, day in and day out.

LOOK AT THESE FEATURES:

- low initial cost
- low operating cost
- easy maintenance
- simple, compact design
- 12 volt electrical system
- 125 c.f.m. at 1165 rpm
- operates two 85 lb. paving breakers at same time

Compare price . . . compare job results—you'll "Go Smith" with "Hardrock Smitty"!

There's also a complete line of Smith Air Compressors in 45 cfm and 75 cfm models, both portable and stationary.

Ask your dealer for an "on the job" demonstration. (write us for complete information and the name of your nearest dealer.)

SMITH AIR COMPRESSORS

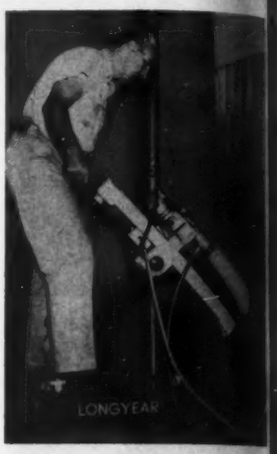
GORDON SMITH & COMPANY, INC., Bowling Green, Ky.

For more facts, use Request Card at page 18 and circle No. 406

Diamond drills offer air, electric drives

Two new industrial diamond [illegible] with optional, interchangeable [illegible] and electric drives have been introduced by the E. J. Longyear Co.

The Model 330 is a 6-inch-capacity swivel drill that drills holes at any angle through reinforced concrete, brick, tile, or stone. It swivels in two directions, raises and lowers on a column attached to its base, or can be taken off its base and mounted on



One of two models available, the Longyear 330 6-inch-capacity swivel drill operates at any angle.

a column or horizontal crossbar. The screw feed head allows the operator to apply all necessary bit pressure with only moderate force on the hand crank.

The Model 305 is a lightweight vertical-hole drill, also of 6-inch capacity. For horizontal drilling, the screw feed mechanism can be removed from the base and anchored to the wall.

Air motors (350 to 1,500 rpm, 90 cfm, 90-psi) and electric motors (1,000 rpm, 110 volts) are all interchangeable.

For further information write to the E. J. Longyear Co., Dept. C&E, 76 S. Eighth St., Minneapolis 3, Minn., or use the Request Card at page 18. Circle No. 68.

Equipment for spraying forms, curing compounds

Hydro-Fog units for spraying concrete forms and applying curing compounds are available from Simplex Forms System, Inc.

The spray equipment is available in three models to suit varying conditions and capacity requirements. Each unit is power-driven by either a 2-hp 4-cycle gasoline engine or an electric motor of comparable power output.

Hydro-Fog is designed to spray any type of concrete form with form oil, and it produces a fine mist at a pressure of 300 psi. It operates as a hydraulic unit and does not use any air pressure, thus eliminating the danger of explosion and the wait for pressure build-up.

The large model has a heavy-gage steel tank of 30-gallon capacity and

s equipped with 60 feet of hose. It easure 30×22×32 inches and weighs pproximately 120 pounds.

A smaller unit, using the same ump and motor, can be mounted on 55-gallon drum. A third portable odel, with a 15-gallon tank, is ounted on wheels.

For further information write to Simplex Forms System, Inc., Dept. C&E, 5405 Industrial Ave., Rockford, Ill., or use the Request Card at page 18. Circle No. 4.

Five-gallon drum warmer for viscous materials

A new, fully automatic 5-gallon drum warmer, which quickly heats viscous materials and maintains them at the temperature and consistency required for easy removal from drums, has been announced by the Harold L. Palmer Co.

The unit is designed to warm drums containing materials such as tar and asphalt. Features include: choice of

two thermostatically controlled temperature ranges—60 degrees to minus 250 degrees F, or 200 degrees to minus 550 degrees F; 2-inch sheet Fiberglas insulation; aluminum reflector; wire-reinforced flexible asbestos gasket for snug fit around drum. The unit plugs into any 110 to 120-volt outlet, weighs 22 pounds, and is equipped with handles for easy portability. For maximum safety, it is provided with polarized (grounded) plugs and legs that suspend the unit off the floor to ground.

For further information write to the Harold L. Palmer Co., Dept. C&E, 28625 Grand River Ave., Farmington, Mich., or use the Request Card that is bound in at page 18 of this issue. Circle No. 13.

For more facts, circle No. 407→

Apparatus for testing bituminous mixtures

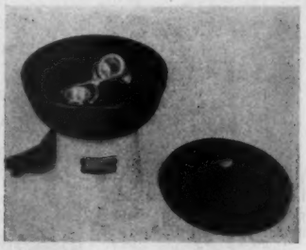
Soiltest, Inc., has available a centrifuge kerosene equivalent apparatus for measuring surface capacity, including absorption, of both coarse and fine aggregates used in bituminous mixtures.

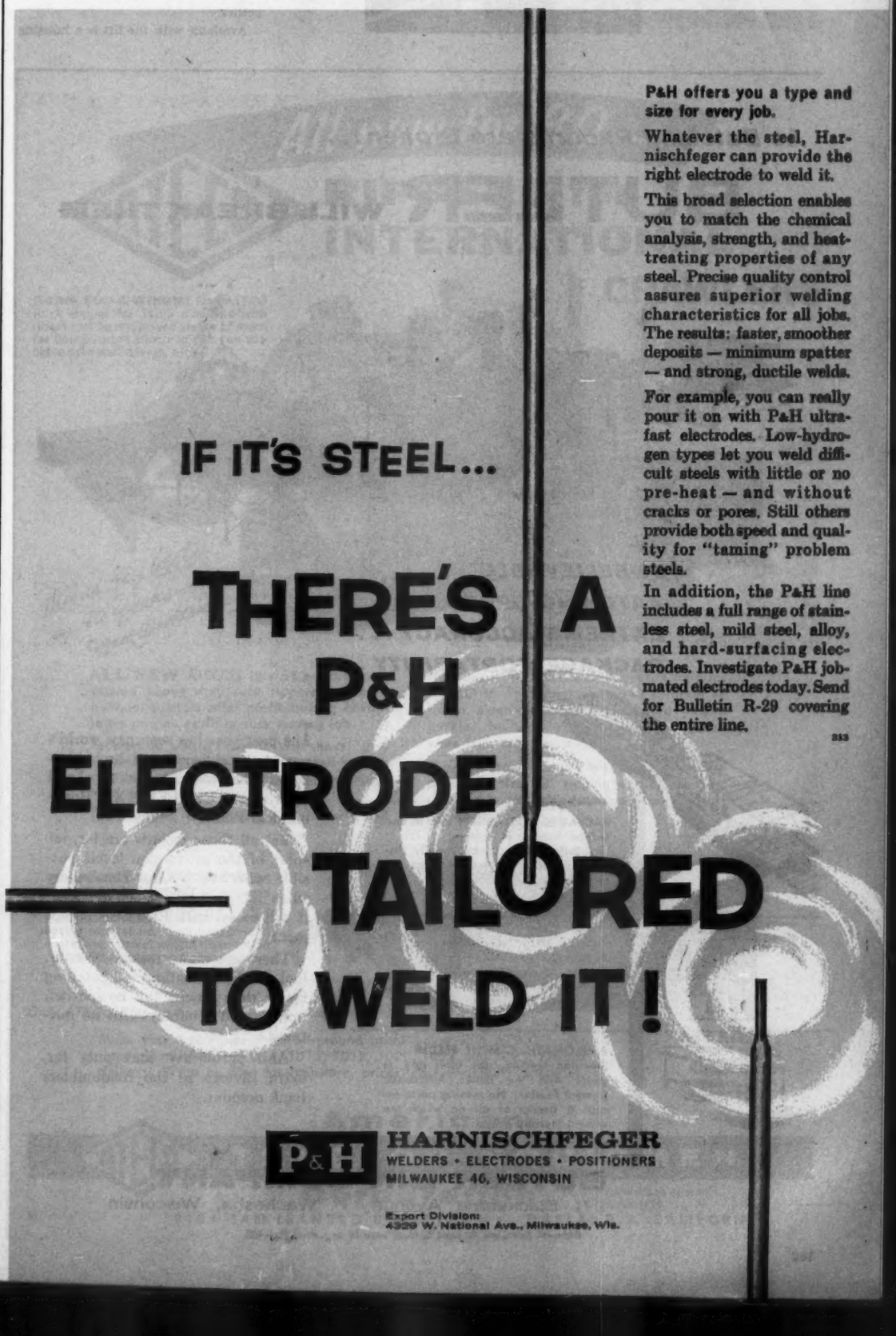
The new apparatus is also used to determine an index (K factor) that indicates the relative particle roughness or degree of porosity.

A protecting dome and cover of Fiberglas surrounds the operating parts of the centrifuge. The dome is mounted on an aluminum circular base that also encloses the motor and serves as a switch mounting.

The firm offers a similar apparatus designed for hand operation, with operating speed developed through a gear-mounted hand-crank assembly.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the card at page 18. Circle No. 94.




IF IT'S STEEL...
THERE'S A P&H ELECTRODE TAILORED TO WELD IT!
P&H offers you a type and size for every job.
Whatever the steel, Harnischfeger can provide the right electrode to weld it.
This broad selection enables you to match the chemical analysis, strength, and heat-treating properties of any steel. Precise quality control assures superior welding characteristics for all jobs. The results: faster, smoother deposits — minimum spatter — and strong, ductile welds.
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In addition, the P&H line includes a full range of stainless steel, mild steel, alloy, and hard-surfacing electrodes. Investigate P&H jobmated electrodes today. Send for Bulletin R-29 covering the entire line.
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HARNISCHFEGER
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4329 W. National Ave., Milwaukee, Wis.

The Dutch-built lift has a hoisting capacity of 550 pounds. A 1½-hp electric motor provides the power.

New lift available for light materials

A new light-materials lift, on which the supporting frames themselves can be raised or lowered, has been introduced by a Netherlands firm.

The lift, of sectional iron and tubular construction, consists of a gin and traveling crab with a double winch. The gin comprises an I-girder, on which the crab can travel backward and forward, and a supporting frame at front and back. The base plates of these supporting frames are partly interconnected and partly free, and the loose elements are bolted together.

Available with the lift is a hoisting platform with adjustable sides, and a special device for increasing the speed of descent to a maximum of 148 to 165 fpm.

The new lift's hoisting capacity is 550 pounds. A 1½-hp 220/380-volt electric motor, provided with push-button switch and automatic limit switch, drives the lift. The motor-driven cable drum can handle up to 165 feet of steel cable.

For further information write to the Netherlands Trade Commission, Dept. C&E, 551 Fifth Ave., New York N. Y., or use the Request Card at page 18. Circle No. 80.

Announce power takeoff for extra-heavy duty

A new extra-heavy-duty power takeoff, designated Spicer PW04, is announced by the Standard Equipment Division of Dana Corp.

Capable of transmitting 340 foot-pounds of torque intermittently, the new unit is especially designed for use on the company's Spicer 612 Synchro-Master 12-speed transmission.

Although basically designed for transmissions with a high pitch-line velocity (those giving extremely high power-takeoff speeds), the new series is also available in models suitable for pitch for use with other types of transmissions, the company states.

For further information write to the Standard Equipment Division, Dana Corp., Dept. C&E, 4100 Bennett Road, Toledo, Ohio, or use the card at page 18. Circle No. 87.

New paving breaker is heavy-duty unit

A heavyweight paving breaker, designated Blue Brute Model WB-82 and designed for the heaviest demolition work, is announced by the Worthington Corp.

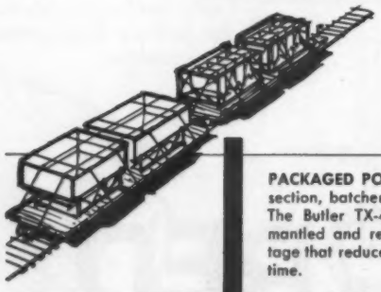
According to the manufacturer, the progressive throttle valve simplifies starting motis under adverse conditions, and features like the bushed front head and throttle valve assure prolonged efficient operation with minimum maintenance required.

The WB-82 is available with spike-driver (for spikes to 1¾-inch heads) and sheeting-driver (for wood sheet-

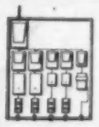
As Batching Records are Broken...

BUTLER WILL BREAK THEM

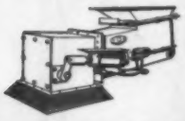
UNBELIEVABLE BATCHING SPEED...
EXTREME ACCURACY...
PACKAGE PORTABILITY...



PACKAGED PORTABILITY (bin in one section, batcher in another)
The Butler TX-4 can be rapidly dismantled and re-erected — an advantage that reduces profit-robbing downtime.



SERVICE ENTRANCE PANEL
This comes in a weatherproof steel cabinet. All circuitry is installed ready for use so you have none of the usual expense of field wiring.



AIRFLOMATIC CEMENT FEEDER
Precision feeding, day after day, is yours with the Butler Airflomatic Cement Feeder. No moving parts except a stream of air on which the cement literally rides.

The past year has seen new world's records established and broken — perhaps half a dozen or more — and all with the BUTLER TX-4 Roadbuilders Plant.

Yet all those records are far, far short of the production levels possible with the TX-4. That's why when the next record comes along, it will be set with BUTLER equipment.

There are many reasons. Faster, fool-proof automation . . . batching faster than trucks can be spotted. Split-pound accuracy with no mistakes.

And portability that puts fat, extra savings in the roadbuilders bank account.

BUTLER BIN COMPANY
971 Blackstone Avenue • Waukesha, Wisconsin

For more facts, use Request Card at page 18 and circle No. 408

ing 2 to 3 inches thick) front heads, which are readily interchangeable with the standard paving-breaker housing.

For further information write to the Worthington Corp., Dept. C&E, 37 Appleton St., Holyoke, Mass., or use the Request Card at page 18. Circle No. 5.

Torque converter for small engines

The Clark Equipment Co.'s Automotive Division has introduced an air-cooled torque converter for use with engines in the 10 to 50-hp class.

The unit is intended for such applications as small road rollers and cranes, winches, mixers, and other like equipment.

The torque converter has a 9-inch wheel and is rated at up to 80 pound-feet torque input. Stall torque ratio is 1.7 to 1. The new unit fits a standard SAE No. 4 flywheel housing. Dry weight is 73 pounds.

For further information write to the Clark Equipment Co., Automotive Division, Dept. C&E, Jackson, Mich., or use the Request Card at page 18. Circle No. 53.

This hydraulic crane boom frame is constructed of tubular steel electrically welded for maximum strength. Lifting capacity on the hook line is 5,000 pounds; line pull is 2,500 pounds. The crane boom may be installed on any Gerlinger lift truck of up to 22,000-pound capacity. The crane may be removed to permit the truck to be operated in conventional manner. For further information write to the **Towmotor Corp.**, Dept. C&E, 1226 E. 152nd St., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 75.

WET JOB?
whether
POWER PLANT

or other wet work—
for "quick dry"...specify...
GRIFFIN
WELLPOINT CORP.
SALES • RENTAL • CONTRACT
881 E. 141st St., New York 54, N. Y.
Hammond, Ind. • Jacksonville, Fla.
Houston, Tex. • W. Palm Bch., Fla.

For more facts, circle No. 409

All new for '60—
ATECO
RIPPERS for INTERNATIONAL CRAWLERS

ROOM FOR A WINCH! New ATECO Rock Ripper for TD25 available with offset tool beam; leaves plenty of room for double-drum winch so you can use cable-operated dozers, etc.

This is my best in 40 years—Mack Woolridge

ALL NEW ATECO's line of performance-proved heavy duty rock rippers for International tractors offer profit-making advantages on any earth or rock moving job.

Teamed up with a dozer or skid shovel, they provide perfect balance for increased traction and higher performance, ripping or earth-moving.

Their rugged, extra-heavy design has licked the tough jobs the world over. Compare ATECO in every detail . . . the pioneer in tractor-mounted rippers. You'll find they're huskier, built to last longer, deliver more work with less downtime.

They're extra versatile, too. Complete range of models (to 72" ripping depth), shanks, wingfoot boots, cable-laying attachments, etc. available.

PERFECTLY-BALANCED TEAM! ATECO Ripper and DROTT Skid-Shovel on this TD20 make a high-production combination you can't beat for moving rock, shale, other hard-to-load materials. Perfect weight distribution improves traction and performance.

Only ATECO Rippers have world-wide acceptance!

Make your International an all-around profit-maker with ATECO's new ripper. Available for TD14, TD15, TD18, TD20, TD24 and TD25. Prompt delivery. Write or wire for literature, prices. East and West deliveries.

*See ATECO CONDEX BOOTH 119

American ATECO TRACTOR EQUIPMENT Corporation
Designers and Manufacturers Since 1920
9131 SAN LEANDRO BOULEVARD • OAKLAND 3, CALIFORNIA
For more facts, use Request Card at page 18 and circle No. 410

Fast and powerful, the Massey-Ferguson 406 tractor shovel offers front, rear, and side visibility; features full-time power steering, instant-reverse with torque converter, and five equal forward and reverse speeds. Low pivot points of the lift arms put the push directly into the load instead of through linkage, providing bulldozer action and a 9,300-pound pry-out capacity. A variety of attachments is available. For further information write to the **Massey-Ferguson Industrial Division,** Dept. C&E, 1009 S. West St., Wichita, Kans., or use the Request Card at page 18. Circle No. 133.

OWEN BUCKETS

THE GIANT OF THEM ALL

The following five combined features make OWEN the big giant performer . . . for any type of clamshell work . . . for any model or make of crane.

1. Block and Tackle Type Reeving
2. One-Piece Head Construction
3. Riveted Bowl Assembly
4. Single Main Shaft
5. Recessed Lips

Added to these construction features are more than fifty years experience in the manufacturing of clamshells . . . and nothing else! For any job that requires a clamshell, there is an Owen to fill the bill . . . backed by proven construction design and over one-half century of experience.

Put the Giant on your crane — OWEN — and know the work will be done faster, better and more economically.

Write today for any specific or additional information

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

For more facts, use Request Card at page 18 and circle No. 411

Announce new line of hydraulic rams

A new line of single-cylinder, single-acting hydraulic rams is announced by the Owatonna Tool Co. of Owatonna, Minn.

Nine sizes are available, from a ram 1 11/16 inches long with a ⅝-inch stroke to a 20¼-inch-long ram with 13½-inch stroke. Capacities are from 2 to 50 tons with maximum working pressures of 8,650 and 10,000 psi.

The rams are said to be compact and lightweight.

For further information write to

the Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn., or use the Request Card that is bound in at page 18 of this issue. Circle No. 45.

Diamond core bits for tough masonry

A new line of thin-wall diamond-surface-set and impregnated masonry bits is offered by the Hoffman Bros. Drilling Co.

According to the manufacturer, the bits retain their original OD to within .005 inch for the life of the bit. They are available in diameters from ⅜ inch to 14 inches, and in lengths to 14 inches.

For further information write to the Hoffman Bros. Drilling Co., Dept. C&E, Box 426, Punxsutawney, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 134.

BLAST IT CLEAN WITH

HIGH PRESSURE STEAM!

Electro-Magic MOTOR STEAM CLEANER

ONLY $329.00 FOB Factory

Large steel wheels supplied. Rubber wheels extra.

Blast grease, road oils and other corrosive deposits from heavy equipment instantly with the Electro-Magic Motor Steam Cleaner. No job is too tough for the Electro-Magic. Cuts hours from cleaning jobs; adds years to the life of equipment.

HOT WATER RINSE ATTACHMENT NOW STANDARD EQUIPMENT ON EVERY ELECTRO-MAGIC UNIT.

ELECTRONICS, INC.
506 Cherry Street
Vermillion, S. Dak.

Please send complete information on the Model 100 Electro-Magic Motor Steam cleaner immediately. I (am) (am not) interested in a dealership.

Name_____ Company_____

Address_____ City_____ State_____

Over 20,000 now being used by contractors, equipment dealers, service stations and garages. Drastically reduce equipment downtime with the Electro-Magic. One unskilled laborer can operate this complete automatic unit . . . just push a button, that's all there is to it.

For more facts, use coupon or Request Card at page 18 and circle No. 412

New medium, heavy-duty truck series is offered

The new Studebaker Transtar series of medium-duty, heavy-duty, and 4-wheel-drive trucks includes 18 models.

Four models are available in the heavy-duty 2-ton series, with gvw ratings ranging from 19,500 to 23,000 pounds. Wheelbases in this series range from 131 to 195 inches, and body lengths from 9 to 14 feet. The 195-inch chassis will accommodate an 18-foot body.

The 2-ton models are powered by Torque Star 289-cubic-inch V-8 engines that develop 210 horsepower at 4,500 rpm.

Transtar transmissions are 4-speed synchromesh on all models. Five-speed direct and overdrive transmissions are optional on models with V-8 engines.

For further information write to the Studebaker-Packard Corp., Dept. C&E, South Bend, Ind., or use the Request Card that is bound in at page 18. Circle No. 82.

Studebaker Transtar medium-duty 1 and 1½-ton models have gvw's ranging from 9,000 to 18,000 pounds. Gross weights on the heavy-duty 2-ton models range from 19,500 to 23,000 pounds.

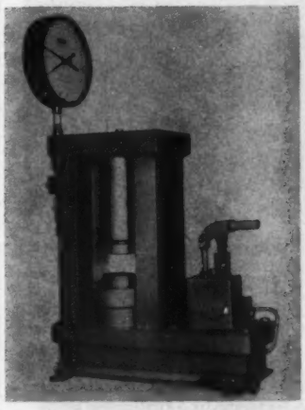
To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

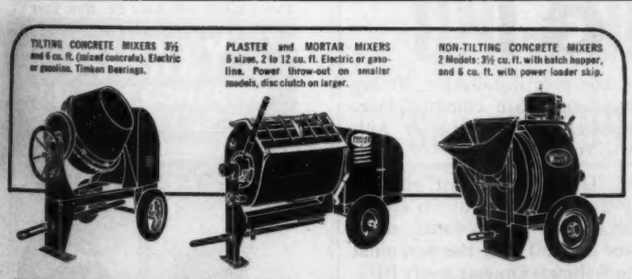
Testing unit available for compression, flexure

Designed specifically for testing small specimens such as 2×2-inch cubes, 3×6-inch and 2.8×5.6-inch cylinders, concrete pipe cores in compression, and soil-cement beams in flexure, the new Forney Model M-100 has a loading capacity of 60,000 pounds and weighs 240 pounds completely equipped.

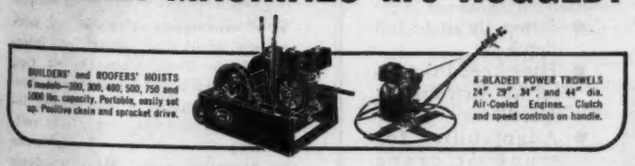
Upper platen assemblies are spherically seated in accordance with ASTM specifications, and there is a variety of standard gages equipped with snap-on connectors.

For further information write to Forney's Inc., Tester Division, Dept. C&E, P. O. Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 47.




TILTING CONCRETE MIXERS 3½ and 6 cu. ft. (mixed concrete). Electric or gasoline. Timken Bearings.
PLASTER and MORTAR MIXERS 5 sizes, 2 to 12 cu. ft. Electric or gasoline. Power throw-out on smaller models, disc clutch on larger.
NON-TILTING CONCRETE MIXERS 2 Models: 3½ cu. ft. with batch hopper, and 6 cu. ft. with power loader skip.

MULLER MACHINES are RUGGED!


BUILDERS' and ROOFERS' HOISTS 6 models—300, 300, 400, 500, 750 and 1000 lbs. capacity. Portable, easily set up. Positive chain and sprocket drive.
4-BLADED POWER TROWELS 24", 29", 34", and 44" dia. Air-Cooled Engines. Clutch and speed controls on handle.

ALL MULLER MACHINES are *tough!* They stand up to rough handling without break-downs or frequent parts replacements, because they are products of the best in engineering, materials, and workmanship. Yet, for all their strength and durability, **MULLER MACHINES** are not high-priced...in fact, no other machines of comparable quality are priced lower.

MULLER MIXER

In addition to the units illustrated here, Muller also manufactures: Floor and Tower Hoppers, Concrete Carts, Foundry Core Sand Mixers, and Space Heaters.

Ask for literature, prices and full details.

MULLER MACHINERY COMPANY, Inc.

Metuchen 14, N. J. Cable Address: MULMIX

For more facts, use Request Card at page 18 and circle No. 413

For Lowest Operating Costs and Minimum Investment

It pays in many ways to standardize on Viber Vibrators. Their amazing versatility—because they are mated—is one big reason why Viber Vibrators handle all your concrete vibrating jobs with the lowest possible investment and the least possible operating cost.

Check the many "mated" advantages below:

They're mated to permit interchangeability of components.

They're mated to give you 64 different vibrators—each with a special ability.

They're mated to make every component salvageable—only that part which is completely worn out is discarded.

They're mated to prevent any major component from becoming obsolete—old and new mate perfectly.

They're mated to reduce your spare parts requirements.

Assemble 64 Different Vibrators From 12 Basic Viber Units

Contractors who standardize on Viber Vibrators give their concrete crew a selection of three interchangeable power units—electric, pneumatic and gasoline...a selection of four interchangeable lengths of flexible drives...a choice of four interchangeable heads—1¼", 2¼", 2½" and 3"...and a multiple coupling for connecting any 2 lengths of shafts together.

Get the facts today! See your dealer or write for detailed information. Viber Company, 726 South Flower Street, Burbank 29, California

VIBER CO.

Pioneers and leaders in the manufacture of Vibrators.

It Pays to Standardize on

Viber Vibrators

For more facts, use Request Card at page 18 and circle No. 414

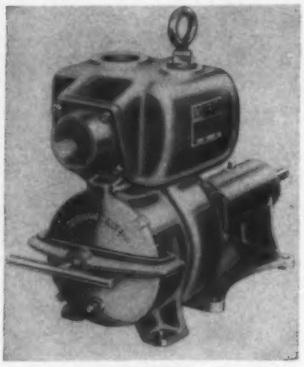
Solids-handling pump is self-priming unit

The Gorman-Rupp Co. announces the addition of the Model 12B2, with 2-inch suction and discharge, to its line of self-priming centrifugal solids-handling pumps.

The unit's impeller design permits the passing of spherical solids up to 1⅛ inches in diameter. It is designed to mount high and dry, with only the suction in the sump.

Capacities range from 40 to 220 gpm. Other sizes available are 3, 4, and 6-inch.

For further information write to The Gorman-Rupp Co., Dept. C&E, 357 N. Bowman St., Mansfield, Ohio, or use card at page 18. Circle No. 10.

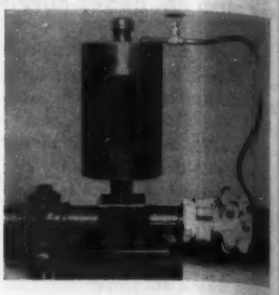


Pile-hammer lube method increases hose life

The McKiernan-Terry Corp. offers a pile-hammer lubrication method said to offer better pile-hammer lubrication, plus increased pile-driver hose life.

With the Dualtube System, lubricating oil never comes into contact with the lining of the steam hose but is carried to the hammer through a separate oil tube in the hose and is force-fed by a positive displacement lubricator equipped with a low-oil warning whistle.

For further information write to the McKiernan-Terry Corp., Pile Hammer Division, 100 Richards Ave., Dover, N. J., or use the Request Card at page 18. Circle No. 79.



FLECO® FACT FILE

. . . reports from contractors who added new money-making ability to their tractors — with Fleco equipment.

With the Fleco M-A Rake, teeth are spaced as desired. Power of a D9, D8 or D7 can be concentrated on from five to ten cast manganese steel teeth. Here, an M-A Rake piles heavy timber cleared from a construction project.

Increased height of the M-A Rake gives extra load carrying ability, extra production. A reinforcing plate in the center of the blade adds strength, protects the tractor.

For high production clearing in areas with larger trees, team a Fleco Treedozer with a D9, D8 or D7. In small dense growth, a wide swath is cleared as the tractor advances steadily in 2nd or 3rd gear. For larger trees, the Knockdown Beam exerts tremendous leverage, while the V-Blade dips beneath the roots and pries the tree from the ground.

FLECO®

Multi-Application, Rock, Root, Brush and Traxcavator Rakes • Root Plows
• Cab Guards • Choppers
• Pull and Detachable Stumpers
• Fire Fans • Treedozers
• Root Cutters • Tree Cutters
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For information, see your Caterpillar-Fleco Dealer or write direct . . .

FLECO Corporation

P. O. Box 2370, Jacksonville, Florida, U.S.A.
Fleco International, Inc. • Fleco Overseas Limited
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For more facts, use Request Card at page 18 and circle No. 415

THINK BIG!

It all began with a small, simple machine for power line pole installation. Today eight and ten foot diameter shafts for building foundations are commonplace. Tomorrow, who knows? Whatever new projects lie ahead, the contractor with a big drilling job will depend on Williams engineers to think big.

Williams LLDH Diggers are BIG, MODERN, DEPENDABLE. For fast, efficient drilling of large-diameter holes up to 110 feet deep and diameters to 96 inches the LLDH is unsurpassed. The engineers at Williams have incorporated, on a large scale, all the "Tried and Proven" design features of the LDH, the perennial favorite of drilling contractors everywhere, to make the Williams Diggers really BIG.

OUTSTANDING FEATURES

- Power thrust to full depth.
- High speed throw-off for each drilling speed.
- Adaptability for truck or crane mounting.

HUGH WILLIAMS

HUGH B. WILLIAMS MFG. CO.
8330 Lovett Ave. • Dallas, Texas
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2101 Corinth St. • Dallas, Texas
Distributor

WRITE FOR ILLUSTRATED DESCRIPTIVE LITERATURE

For more facts, use Request Card at page 18 and circle No. 416

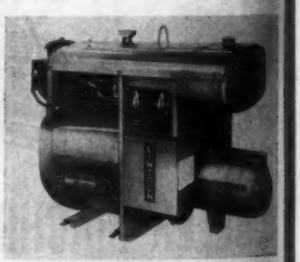
New demolition tool is powerful, lightweight

A newly designed demolition tool is offered by Chicago Pneumatic.

Designated Model CP-124, this 80-pound-class unit features small over-all length, better balance, and easier riding qualities. Other features include a body-contoured backhead, which permits the operator to rest the tool against his thigh for easier point spotting, and a rubber-cushioned shock-resistant retainer.

The CP-124 is available with a variety of point accessories.

For further information write to the Chicago Pneumatic Tool Co., Dept. C&E, 6 E. 44th St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 103.



Small air-cooled-engine welders, with engine idler and self-starter, introduced by The Lincoln Electric Co., are said to be convenient and economical. Features of the welder include engine speed control and self-starting. The welder will accelerate to operating speed instantaneously when the arc is struck, and slow to idling speed 8 to 10 seconds after the arc is broken. Engine wear is reduced, and fuel consumption is dropped 10 to 35 per cent with the controlled performance, states the manufacturer. For further information write to **The Lincoln Electric Co.,** Dept. C&E, P. O. Box 3115, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 83.

Product LITERATURE

To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Electrode pocket guide—a new edition of the Air Reduction Sales Co.'s "Electrode Pocket Guide." The 64-page booklet contains complete information on all types of electrodes available from Airco. Application and procedure data included. Eight-page foldouts at rear of book contain charts of recommended Airco electrodes for welding ASTM and trade-name steels, and comparison tables for mild and hardfacing electrodes of leading manufacturers. Form ADC-650.

Write to the Air Reduction Sales Co., division of Air Reduction Co., Inc., Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 34.

Self-propelled scraper—a well illustrated brochure describing the 28-yard, 360-hp Model B Tournapull self-propelled scraper. Emphasizes such features as choice of various combinations of engine and transmission; power-transfer differential that automatically shifts power to the drive wheel with the best footing; instant-response electric controls; and efficient point-of-action electric motors that perform all of the Model B's steering and work functions. Form No. TP-433.

Write to the LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 61.

Grinding concrete—an illustrated bulletin on the subject of grinding concrete. Gives complete information on the proper accessories and speeds for both wet rubbing and dry grinding on various jobs. Also provides data on the proper equipment for finishing hardened concrete walls, floors, and ceilings. Includes a section on grinding prestressed-concrete beams. Bulletin No. 5922.

Write to the Stow Mfg. Co., Dept. C&E, 40 Shear St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 98.

Corrugated metal pipe—a catalog on Armco corrugated metal pipe and pipe-arch. Benefits are described and tips given on making the correct selection for the application. Useful tables; brief data on the various types of structures; information about joints and fittings and proper installation methods. Typical installations pictured. Catalog CMS-5859.

Write to the Armco Drainage & Metal Products, Inc., Dept. C&E, 703 Curtis St., Middletown, Ohio, or use the card at page 18. Circle No. 135.

Drilling, boring equipment—a bulletin describing the Ka-Mo line of horizontal, vertical, and angular drilling and boring equipment. Discusses the wide variety of air, hydraulic, electric, and gasoline-powered Ka-Mo drills available; contains several on-the-job photos. Includes specifications for both hand-feed and power-feed track units. Illustrated with tables and photos. Bulletin KMO-633.

Write to the Kwik-Mix Co., Dept. C&E, 235 W. Grand Ave., Port Washington, Wis., or use the Request Card at page 18. Circle No. 113.

Renting steel-sheet piling—a catalog on Foster steel-sheet piling for rental. Discusses advantages of renting sheet piling; illustrates typical applications; and details standard, rolled, and fabricated sections. Also illustrates typical pile arrangements for rectangular and circular cofferdams, and lists nominal lengths of straight walls and dimensions of pile cells. Special sections describe

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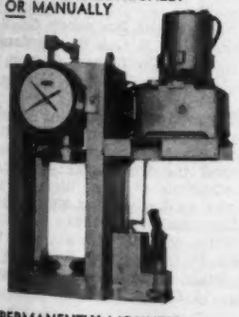

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Save LABOR, MATERIAL, TIME!

Simple mechanical assembly and pre-engineered techniques for handling virtually any forming condition make UNI-FORM Panels your best bet for fast, low cost forming. Successful contractors everywhere are using the UNI-FORM system to form bridges, overpasses, culverts, piers and abutments, because their experience has shown that UNI-FORM Panels give them the speed, flexibility and economy required to handle this complex type of forming at the lowest possible cost.

Let us prove our point. Send a set of plans for detailed forming specifications, recommendations and cost analysis. There's no obligation, of course.

P1501

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lightweight sheet piling, H-bearing pile, Foster rail pile, pipe pile, and accessories. Catalog No. 400.

Write to the L. B. Foster Co., Dept. C&E, P. O. Box 1647, Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 67.

Tractor grouser bars—a "how-to" wall chart giving step-by-step instructions for replacing tractor grouser bars. Also includes detailed ordering information for Amsco manganese or carbon-steel bars covering all leading makes of tractors. A similar chart provides instruction and specifications covering two types of dipper-tooth repointers and repointer bars.

Write to the American Brake Shoe Co., American Manganese Steel Division, Dept. A, Dept. C&E, 389 E. 14th St., Chicago Heights, Ill., or use the Request Card at page 18. Circle No. 114.

Truck crane—a catalog describing the construction and operating characteristics of the American 700 Series 60-ton truck crane. Text illustrated with on-the-job photographs and close-ups of various components. Catalog No. 770-TG-2.

Write to the American Hoist & Derrick Co., Dept. C&E, 63 S. Robert, St. Paul, Minn., or use the Request Card at page 18. Circle No. 128.

Hazard-warning planner—a pocket-size planner for taking the guesswork out of the job of providing adequate roadside warning devices along construction sites. Shows at a glance practically every factor governing the placement of signs, flagmen, traffic cones, barricades, lanterns, torches, and flashers.

Write to the R. E. Dietz Co., Dept. RB, Dept. C&E, P. O. Box 1214, Syracuse 1, N. Y., or use the Request Card at page 18. Circle No. 86.

Radiator servicing—a booklet covering the entire procedure for setting up a radiator servicing department. Shows the latest compact shops, as well as Inland testing, cleaning, and repairing units, individually and in combinations. Contains complete price list and specification chart. In addition, various methods for arranging the necessary equipment are charted.

Write to the Inland Mfg. Co., Dept. B-210, Dept. C&E, 1108 Jackson St., Omaha 2, Nebr., or use the Request Card at page 18. Circle No. 39.

Concrete retarders—two bulletins describing retardation of initial set in concrete. Illustrated with graphs, they are titled "Retarders and Plastic Concrete" and "Retardation of Initial Set: Effect on Hardened Concrete." Bulletins No. 438–7 and 438–8, respectively.

Write to the Dewey & Almy Chemical Division, W. R. Grace & Co., Dept. C&E, 62 Whittemore Ave., Cambridge 40, Mass., or use the Request Card at page 18. Circle No. 38.

Tractor shovel—a newly revised catalog covering the Allis-Chalmers HD-11G tractor shovel. Illustrated description of its design and construction features; work potentials and capacities given. Catalog MS-1133.

Write to the Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 6.

Welding symbols—designer's guide for welded construction, revised to include recent revisions in the standard American Welding Society symbols. Contains charts and illustrations providing information on the application of welding symbols and other basic design data on welds. Bulletin No. 1100.1.

Write to The Lincoln Electric Co., Dept. C&E, P. O. Box 3115, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 116.

Self-propelled crane—a bulletin on the 65-ton Lorain Model MC-700 Moto-Crane. The machine features hydraulically operated Power-Set outriggers as standard equipment, 8×4 carrier, road speeds up to 37.6 mph, removable counterweight, folding gantry, and precision control with spur-gear-driven boom hoist. Bulletin No. 85743–9A.

Write to The Thew Shovel Co., Dept. C&E, 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 42.

Prestressing materials, equipment—a comprehensive catalog covering the complete Intercontinental Equipment line of material and equipment for prestressing. Contains illustrations, and gives information on prices.

Write to the Intercontinental Equipment Co., Prestressed Concrete Division, Dept. C&E, 120 Broadway, New York 5, N. Y., or use the Request Card at page 18. Circle No. 117.

Masonry, concrete saws—a folder on new Truco masonry and concrete saws and blades. Includes descriptions of the firm's line of abrasive and diamond blades, heavy-duty masonry saws, concrete-cutting saws, a standard masonry saw, and a stone-cutting saw.

Write to the Truco Masonry Drilling Division, Wheel Trueing Tool Co., Dept. C&E, 3200 W. Davison, Detroit 38, Mich., or use the Request Card at page 18. Circle No. 31.

Crane safety device—a brochure describing the Boomsnub hydraulic cushion, a unit designed to cushion boom backlash caused by sudden loss of load. According to the literature, momentum of recoil is hydraulically stopped within 2 or 3 degrees of boom rotation.

Write to the Boomsnub Co., Dept. C&E, 201 S. E. Oak St., Portland 14, Ore., or use the Request Card at page 18. Circle No. 118.

Excavator—a bulletin describing the performance of the Eimco 105 excavator on three recent major jobs around the United States. Contains illustrations of these units at work, as well as English and metric specifications. Bulletin L-1091.

Write to The Eimco Corp., Dept. C&E, P. O. Box 300, Salt Lake City 10, Utah, or use the Request Card at page 18. Circle No. 119.

Epoxy compounds—a technical bulletin on the applications of the new Sika epoxy compounds for bonding, patching, joint and crack sealants, surface coatings for concrete, and for the resurfacing of pavements. Bulletin SEC-759.

Write to the Sika Chemical Corp., Dept. C&E, 35 Gregory Ave., Passaic, N. J., or use the Request Card at page 18. Circle No. 136.

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HIGHER PRODUCTION

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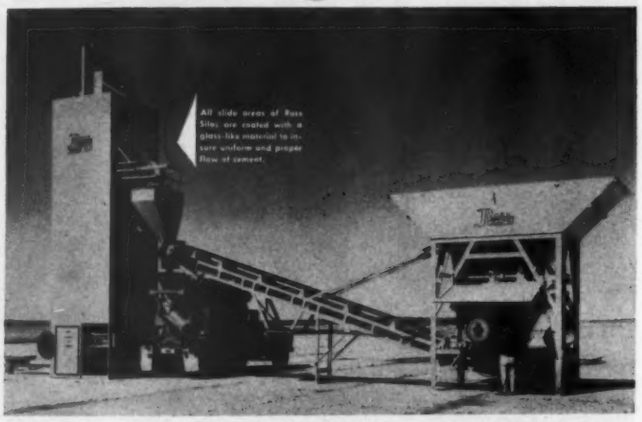

The Ross 30-3 Batching plant and 350-B bbl. cement silo are the proud products of Ross . . . the leading manufacturer of portable batching and equipment. Highly maneuverable, portable, easy to transport and set up, the Ross plant is the unexcelled leader in production.

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HAUL MEDIUM WEIGHT CONSTRUCTION EQUIPMENT, PORTABLE BUILDINGS, TOOLS, AND MACHINERY EASILY AND ECONOMICALLY.

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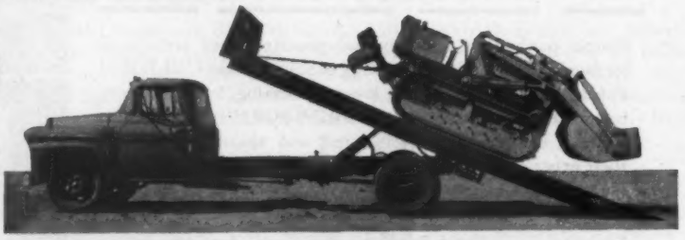


- Fits all trucks 84" to 154", cab to axle.
- Hydraulically operated with controls at the side of the ramp.
- Mounts without removing truck frame cross member.
- Load rating—up to 12 tons.
- Rugged power hydraulic winch operated off truck power take-off.
- Available with wood or steel platform with steel approach plate and steel cab protector.
- Hinge point located over rear spring shackle for better stability and less stress on truck frame.

AVAILABLE ALSO IN HEAVY DUTY MODELS FOR TANDEM AXLE TRUCKS

SCHWARTZ MAKES IT A ONE-MAN JOB!

Now, with a SCHWARTZ RAMP HOIST, *one man* can load, transport, and unload those hundred and one pieces of equipment that do not justify the use of heavy duty low-boy trailers. With the ramp lowered, both mobile and other equipment can be winched onto the ramp and safely transported. The low cost of the SCHWARTZ RAMP HOIST will be quickly paid for in savings on time and labor.

WRITE TO DEPT. RH-20 for complete information.

SCHWARTZ MANUFACTURING COMPANY
Lester Prairie, Minnesota

For more facts, use Request Card at page 18 and circle No. 419

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

Welding accessories—an arc-welding supply catalog giving information on the complete line of Hobart arc-welding accessories and supplies including: head shields, grinding shields, goggles, cleaning tools, electrode holders, cable connectors, ground clamps, work holding clamps, welding cable, protective clothing, welding gloves, and miscellaneous equipment. Catalog EW-211.

Write to the Hobart Bros. Co. Dept. C&E, Box 8129, Troy, Ohio, or use the Request Card that is bound in at page 18. Circle No. 90.

Fir plywood—a quick-reference catalog containing up-to-date basic information on fir plywood standard grades and specialty products. Well illustrated with tables, photographs, and drawings. Form No. S-60.

Write to the Douglas Fir Plywood Assn., Dept. C&E, 1119 A St., Tacoma 2, Wash., or use the Request Card at page 18. Circle No. 19.

Proper grouting practices—a bulletin explaining how to avoid shrinkage through the use of properly applied nonshrink grout. Describing successful grouting techniques with Embeco nonshrink grout, the booklet outlines and illustrates common methods of grouting different types of equipment, the mixing and placing of grout, and cold and hot-weather grouting. Also includes information on recommended mixes and estimating tables. Bulletin E-1d.

Write to The Master Builders Co., Dept. C&E, 7016 Euclid Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 137.

Asphalt joint heater—illustrated literature on an infrared joint heater for providing sound longitudinal and lateral joints in asphaltic pavement. Gives detailed descriptions of each of the units that compose the joint heater (which is attached to a paving machine), as well as the application and benefits of this method.

Write to the Q. & W. Equipment Co., Dept. C&E, 91 O St. S.E., Washington 3, D. C., or use the Request Card at page 18. Circle No. 69.

Emergency floodlighting—a catalog describing and illustrating the complete Stonco line of lightweight, heavy-duty, and vaportight cast-aluminum portable emergency floodlights. Catalog H.

Write to the Stonco Electric Products Co., Dept. C&E, 333 Monroe Ave., Kenilworth, N. J., or use the Request Card at page 18. Circle 95.

Form-locking device—a brochure describing the Heltzel Cam-Lok locking device for highway forms. One-quarter turn of the cam provides tight, rigid form joints that eliminate sledging and common form damage, according to the literature.

Write to the Heltzel Steel Form & Iron Co., Dept. C&E, Warren, Ohio, or use the Request Card at page 18. Circle No. 57.

Steel joists—an illustrated booklet describing Ceco open-web steel joists, steel roof deck, and Cecor centering, for construction of lightweight roof and floor systems. Also contains information on Ceco's steel roof deck and Cecor centering used as permanent form material for concrete slabs over steel joists or beams. Includes tables of available dimensions, allowable loading, complete specifications, and recommended handling and erecting procedures. Booklet No. 3001-P.

Write to Ceco Steel Products Corp., Dept. C&E, 5601 W. 26th St., Chicago 50, Ill., or use the Request Card at page 18. Circle No. 28.

Belt conveyor—a bulletin on the new Stephens-Adamson sectional belt conveyor. Features comprehensive technical data, pre-engineering advantages, and an exploded view of the unit with all components marked. Bulletin No. 458.

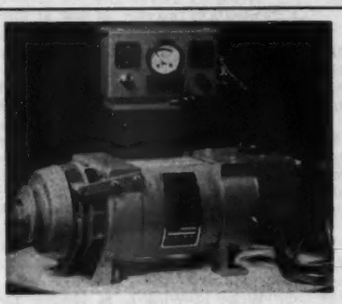
Write to the Stephens-Adamson Mfg. Co., Dept. C&E, Ridgeway Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 101.

Earthmover line—a 24-page folder depicting the complete line of International construction equipment. Among the units described in the profusely illustrated publication are crawler tractors in six power classes, five Payscraper and Paywagon units, two Payhauler models, five International Drott 4-in-1 rigs, and four International Superior sidebooms. Folder No. CR-650-K.

Write to the International Har-

(*Continued on next page*)

Use the Request Card at page 18 to obtain any of the literature described in this section.



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the Electrol GenerAC will supply shop-type electrical power from your truck, car or tractor — anytime, anyplace.

This high-output, 115/230-volt, 60-cycle alternator is available in a size for your every requirement.

Mounting is simple, with kits available for all popular makes of vehicles.

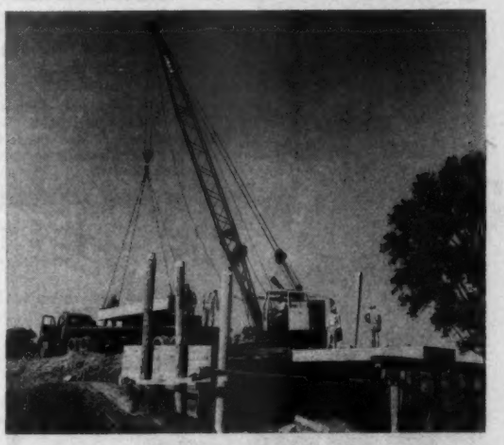
Write to

GenerAC Sales Inc. 124 S. Main Street Wales, Wisconsin

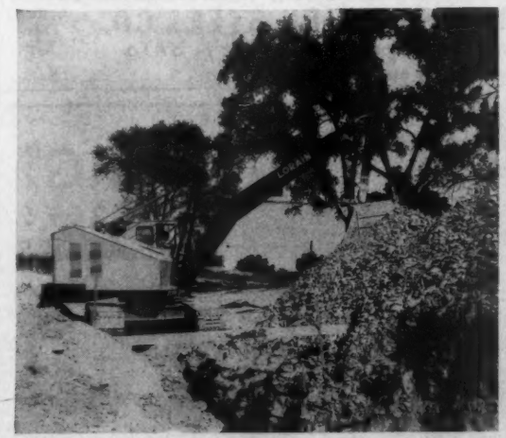
For more facts, use Request Card at page 18 and circle No. 420

HEAVY DUTY ¾-YARD SHOVEL is fast, rugged, a real profit-maker. Two-lever, "Joy-Stick" controls are available to speed operations. Choice of three crawlers. Boom is all welded with cable crowd, power dipper trip.

VERSATILE 18-TON CRANE with simple, precision controls. Exclusive square-tubular-chord boom boosts payloads. Simultaneous swing, hoist and travel available. Crane converts to dragline, clamshell, shovel or hoe.



LORAIN 26: FAST WAY TO MAKE A FAST BUCK



HARD DIGGING HOE has the weight for forceful "crowding" . . . the stability and power to work toughest materials. Long, gooseneck boom permits maximum digging ranges. All control linkage on anti-friction bearings.

DRAGLINE AND CLAMSHELL have long life, swing clutches for fast action. Hoist drums are mounted on anti-friction bearings. Big crawlers give super-flotation. Lighter, stronger boom increases bucket reaches.

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PLANTS: In Lorain, Elyria and Bucyrus, Ohio . . . PRODUCTS: Power shovels, cranes, draglines, clamshell, and hoes on crawlers from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . OUTLETS: Lorain products sold and serviced by 249 distributor outlets throughout the world.

For more facts, use Request Card at page 18 and circle No. 421

(Continued from preceding page)

vester Co., Dept. C&E, 180 N. Michigan Ave., Chicago, Ill., or use the Request Card that is bound in at page 18. Circle No. 60.

Crane—a brochure on the 11-ton Little Giant Model 24 machine. The unit's direct power train is illustrated in a schematic line drawing. Action pictures and specifications.

Write to Little Giant Crane & Shovel, Inc., Dept. C&E, E. 16th and Howard Drive, Des Moines 13, Iowa, or use the Request Card that is bound in at page 18 of this issue. Circle No. 120.

Lubricant—offer of a free trial 16-ounce push-button can of a Whitmore lubricant for increasing the life of open chains. According to the company, this lubricant can now be applied faster and more easily to conveyor, elevating, and transmission chains of all types; said to inhibit rust and corrosion even in salt atmospheres.

Write to The Whitmore Mfg. Co., Dept. C&E, Drawer 160 Sta. C, Cleveland 4, Ohio, or use the Request Card at page 18. Circle No. 12.

Ephemeris—the 1960 Gurley ephemeris. The 92-page booklet has charts showing northern, southern, and equatorial stars; these are keyed to tables in the booklet. Also includes bound-in charts for simplifying the computation of Polaris. Lists 28 selected stars for determining stellar observations and gives complete instructions for computing azimuths by methods similar to those used in observations of the sun and Polaris.

Write to W. & L. E. Gurley, Dept. C&E, 518 Fulton St., Troy, N. Y., or use the Request Card at page 18. Circle No. 8.

Pipelaying rigs—a booklet on the Caterpillar No. 572 Series D and MD7 pipelayers. Stresses such features as increased horsepower, dry-type air cleaner, and lifetime-lubricated rollers. Console controls, high ground clearance, and torque-converter drive also discussed. Brief specifications included. Form No. 33342.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 121.

Safety flasher light—an illustrated bulletin describing the Fageol Model HD-2T transistorized safety flasher light. Explains how the transistor circuit improves the light's performance and eliminates field service or adjustment. Also lists other features such as the tamperproof locking device and heavy-duty 8-cell battery. Form L-911A.

Write to the R. D. Fageol Co., Dept.

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

C&E, Box 328, Kent, Ohio, or use the Request Card at page 18. Circle No.

Torque converters—a folder on the Clark Equipment Co.'s new 14- and 16-inch torque converters for heavy-duty, off-the-road vehicles. In addition to detailed descriptions of optional equipment, such as clutch controls and reduction drive, complete power curves for each of the three basic models are provided. Bulletin FFS-5.

Write to the Clark Equipment Co., Automotive Division, Dept. C&E, Jackson, Mich., or use the Request Card at page 18. Circle No. 54.

Hardsurfacing—a revised fact file covering M&T's complete line of open-arc and submerged-arc hardsurfacing electrodes and wires. An individual card for each type provides full technical information at a glance. A quick-reference application chart and a newly devised mechanical-property chart are provided.

Write to the Metal & Thermit Corp., Dept. C&E, Rahway, N. J., or use the Request Card at page 18. Circle No. 62.

Crushing plant—literature on the Cedarapids Super Commander portable tandem-crusher aggregate plant, newly designed to include a twin-jaw primary crusher. A drawing illustrates the advantages of horizontal design. On-the-job photos included. Bulletin SC-1.

Write to the Iowa Mfg Co., Dept. C&E, 916 16th St., N.E., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 58.

Calcium chloride—a booklet entitled "Calcium Chloride and Salt Mixtures." Well illustrated, it includes sections on benefits of using mixtures, when, where, and how to use them, and significant results.

Write to the Calcium Chloride Institute, Dept. C&E, 909 Ring Bldg., Washington 6, D. C., or use the Request Card at page 18. Circle No. 51.

Rotary compressor—a bulletin descriptive of the Davey Model 60 RP Hydrovane rotary compressor. Includes complete specifications, action photos, and a listing of design features. Emphasized are Perma-Vane rotor blades, said to eliminate blade deterioration and breakage.

Write to the Davey Compressor Co., Dept. C&E, Franklin Ave., Kent, Ohio, or use the Request Card at page 18. Circle No. 17.

Prestressed concrete—photographs and job stories emphasizing the role played by Pozzolith in achieving high concrete qualities in prestressed work. A prestressed lift slab, 120-foot-long prestressed bridge girders, and a 2-million-gallon prestressed water tank are some of the projects covered. Both pretensioned and post-tensioned projects are featured. Bulletin MRB-P-13.

Write to The Master Builders Co., Dept. C&E, 7016 Euclid Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 138.

Psi calculator—the Forney Psi calculator for concrete products. Completely revised, it now includes instant conversion data from test load to psi on 17 standard test specimens and masonry units ranging from 2×2-inch cubes and 3×6-inch cylinders to 12×16-inch and 12×12-inch masonry units. Pocket-size and easy to use.

Write to Forney's Inc., Tester Division, Dept. C&E, P. O. Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 14.

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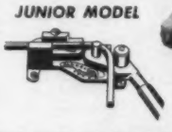
JUNIOR MODEL

JUNIOR MODEL



SENIOR MODEL BAR CUTTER

SENIOR MODEL BAR BENDER

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Gasoline-powered unit especially designed for surfacing concrete highways, runways, streets, floors. Includes exclusive power takeoff for attaching "BERG" flexible shaft surfacing equipment.

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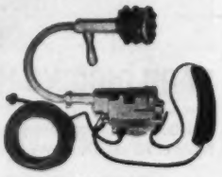

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WIRE OR WRITE FOR DETAILS . . .

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For more facts, use Request Card at page 18 and circle No. 424

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Tractor shovels—literature describing Trojan tractor shovels, Models 134 and 164. Lists standard and optional equipment; gives complete specifications.

Capacities range from 1 to 1⅔ yards for the 134; from 1½ to 2 yards for the 164.

Write to the Yale & Towne Mfg. Co., Trojan Division, Dept. C&E, Clinton St., Batavia, N. Y., or use the Request Card at page 18. Circle No. 123.

Diesel-engine maintenance—a 24-page booklet on diesel-engine maintenance. Tells how to increase equipment availability, reduce operating costs, and obtain better engine performance. Drawings illustrate text.

Write to the Cummins Engine Co., Inc., Dept. C&E, Fifth St., Columbus, Ind., or use the Request Card at page 18. Circle No. 130.

Materials spreader—a catalog giving features and specifications on the Fox mountable materials spreader designed specifically for one-man operation with dash-mounted controls. According to the literature, these units will spread in widths up to 40 feet at speeds up to 40 mph.

Write to the Fox River Tractor Co., Dept. C&E, Box 469, Appleton, Wis., or use the Request Card at page 18. Circle No. 24.

Soils-testing equipment—a 316-page catalog describing over 3,400 different items in the Soiltest line, ranging from a small pocket-sized soil penetrometer to completely equipped mobile laboratories. Contains approximately 1,500 illustrations.

Write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 124.

Dual cement batcher—an illustrated fact sheet describing a Heltzel dustless, dual cement batcher designed to increase the capacity of any batch-truck plant. According to the literature, the new batcher permits simultaneous loading of a 2-section batch truck. Three and 4-compartment trucks can be loaded in only two stops.

Write to the Heltzel Steel Form & Iron Co., Dept. C&E, Warren, Ohio, or use the Request Card at page 18. Circle No. 56.

Welding, cutting torches—a catalog on the Air Reduction Sales Co.'s line of gas welding and cutting hand torches, outfits, tips, and accessories. Specifications and photographs included. Form ADC-702E.

Write to the Air Reduction Sales Co., a division of Air Reduction Co., Inc., Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 55.

Progressive-capacity batching—a manual describing a "progressive-capacity" batching process said to increase batch-plant production from 250 to 800 cubic yards per day through the use of Boardman batching equipment. Well illustrated with photographs and dimensional drawings. Specifications included.

Write to The Boardman Co., Dept. C&E, P. O. Box 1152, Oklahoma City, Okla., or use the Request Card at page 18. Circle No. 33.

Post-tensioning—a bulletin describing force development calculations, detailing and placement plans, tendon and anchorage assemblies, stressing and grouting equipment, and field labor procedures for cast-in-place and precast post-tensioned concrete construction. Detailed drawings show proven methods of post-tensioning. Bulletin 70-6.

Write to Joseph T. Ryerson & Son, Inc., Dept. C&E, Box 8000-A, Chicago 80, Ill., or use the Request Card at page 18. Circle No. 125.

Trucks—illustrated literature with complete specifications on two new Diamond T heavy-duty trucks. Both models—738R and 838R—are powered with the manufacturer's heavy-duty, wet-sleeve, valve-in-head engines. Gvw ratings are as high as 55,000 pounds.

Write to the Diamond T Motor Truck Co., Dept. C&E, 4401 W. 26th St., Chicago 23, Ill., or use the Request Card at page 18. Circle No. 20.

Scraper—a catalog on the International Model 295 Payscraper. The machine features a 34-yard heaped capacity and offers speeds up to 33.5 mph.

Write to the International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card that is bound in at page 18. Circle No. 126.

Portable rotary compressor—a bulletin describing the features of the Le Roi Model 125RG2 portable rotary compressor. A sliding-vane-type, 2-stage unit, the 125RG2 delivers 125 cfm of air at 100 psi at 1,600 rpm. The text is illustrated with photographs.

Write to the Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 1706 S. 68th St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 49.

Beam service press—illustrated literature describing a new OTC hydraulic press that quickly removes and installs equalizing-beam center and end bushings on Hendrickson tandems. Bulletin No. EB-9.

Write to the Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 109.

Crane-excavator—a catalog on the American 300 Series crawler crane-excavator. Describes and illustrates the machine's many features; stresses its ability to operate as crane, magnet, clamshell, dragline, and backhoe. Catalog No. 730-CG-2.

Write to the American Hoist & Derrick Co., Dept. C&E, 63 S. Robert, St. Paul, Minn., or use the Request Card that is bound in at page 18. Circle No. 29.

Concrete-floor grinders—literature describing the construction and operating features of a variety of Edco concrete-floor grinders. Text illustrated with photographs. Specifications included.

Write to the Equipment Development Co., Dept. C&E, 2700 Garfield Ave., Silver Spring, Md., or use the Request Card that is bound in at page 18. Circle No. 127.

Diamond drill bits—detailed information, including specifications, assembly data, and prices, on Asco diamond drill bits. Illustrations and descriptions of the company's extensive line of coring and noncoring drill bits, casing bits and shoes, reaming shells, blast-hole and pilot bits. Catalog No. 502.

Write to Anton Smit & Co., Inc., Dept. C&E, 111 Eighth Ave., New York 11, N. Y., or use the Request Card that is bound in at page 18. Circle No. 41.

Forms for voids—a fact sheet on Jay-Void forms for forming voids in grade-beam and slab construction. Made of Freezurboard, the forms can be butted for desired width or length. Literature illustrated with drawings and photographs.

Write to the Lawrence Paper Co., Construction Products Division, Dept. C&E, Lawrence, Kans., or use the Request Card at page 18. Circle No. 115.

Sidewalk canopies—literature on 6-foot-wide Patent Scaffolding sidewalk-canopy frames. Illustrated with photographs. Includes application details of interest to those engaged in overhead construction work in heavily populated areas.

Write to The Patent Scaffolding Co., Inc., Dept. C&E, 38-21 12th St., Long Island City 1, N. Y., or use the Request Card that is bound in at page 18. Circle No. 129.

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For more facts, use Request Card at page 18 and circle No. 425

Better management concerns dealers at

AED's 4

At AED's 41st Annual Convention distributors took a look back at their performance in 1959, and a long hard look ahead with a view toward improving that performance in 1960.

On a national basis, the sales volume of 1959 showed a moderate increase over 1958. Profits in '59, however, were still mighty slim.

It looked as if 1960 would repeat the pattern of more business and less profits, unless distributors themselves did something about it. During the 5-day meeting, many leaders of the industry offered their suggestions to improve the profit picture. The speakers also expressed concern over the lagging federal highway program.

With a total attendance of about 4,100, the convention was held at the Conrad Hilton Hotel in Chicago from January 24 through 28. During the afternoons and evenings, some 1,530 distributors and 1,840 manufacturers were given the opportunity to get together to work out their mutual problems. At Condex, in the lower lobby of the Hilton, 90 manufacturing companies exhibited their products and established contact with distributors.

Fitzpatrick

AED's 1959 president, F. J. Fitzpatrick, had some sound advice for distributors. In his "President's Message," he stated that profits during the coming year would increase only if distributors did a better job of managing their individual companies.

In order to make management more efficient, Fitzpatrick made two suggestions: "First, to organize properly and train the personnel in our companies; and second, to educate and train our customers. The first job involves fundamentals [such as] a sound business sense for inventory, for financing, for extension of credit, for training machinery, and for putting the right man in the right job."

The second job involves educating customers "so that they will not allow themselves to be oversold." Too often, distributors set a small contractor up in business with new equipment he cannot afford to own. This means that the small contractor bids unreasonably low in an effort to get work to pay for the equipment. He does not allow himself enough of a profit to stay in business. His low bids also take work away from the well established contractor. Nobody benefits. When the small contractor goes broke, it is the dealer who is left holding the financial bag.

Rather than sell the small contractor expensive new equipment, Fitzpatrick suggested selling him used

tributor Doings

ual meeting

Newly elected members of AED's 1960 executive committee are: P. D. Hermann, executive secretary; Braxton Blalock, Jr., vice president; H. J. Mayer, senior vice president; J. A. Benson, president; R. F. Newlin, vice president; Boyd Somerville, vice president; and W. R. Parnell, treasurer.

quipment that he can afford to buy. ling the used equipment would lso help to ease another critical roblem—high inventories of trade- n equipment.

Reporting on the over-all picture f distributors' business during 1959, itzpatrick had this to say: "If we're alking pure sales volume, it is safe o say that 1959 fulfilled its promise f a moderate increase. And this was onfirmed by a recent spot check of istributor members throughout the ountry. The survey showed sales of ew equipment last year were up 5 o 10 per cent. This was the average, nd, obviously, in every region there ere distributors who did better and ome not nearly as well."

Although Fitzpatrick admitted that he federal highway program was the iggest single influence on distribu- ors' business during 1959, he warned hat the "industry has become trans- fixed with the idea that increases in ales must come from the highway rogram . . . or not at all." He sug- ested that dealers broaden their ales picture by looking toward mar- kets other than highway construc- ion.

Prentiss

The nation's road program is in serious trouble because of lack of public support. Maj. Gen. Louis W. Prentiss (ret.), executive vice presi- dent of the American Road Builders' Association, emphasized this problem in his address.

Although the country's need for better highways has never been more pressing, Prentiss pointed out that "criticisms of the highway program have seldom been more caustic." In his speech, he explained the reasons for the unjustified criticism and the means by which the industry could gain public support.

(*Continued on next page*)

In the Minneapolis-Moline suite, shapely Juanita Heim, as Miss Minne Mo, is hostess to visiting distributors.

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Warns Miss Southern Tire

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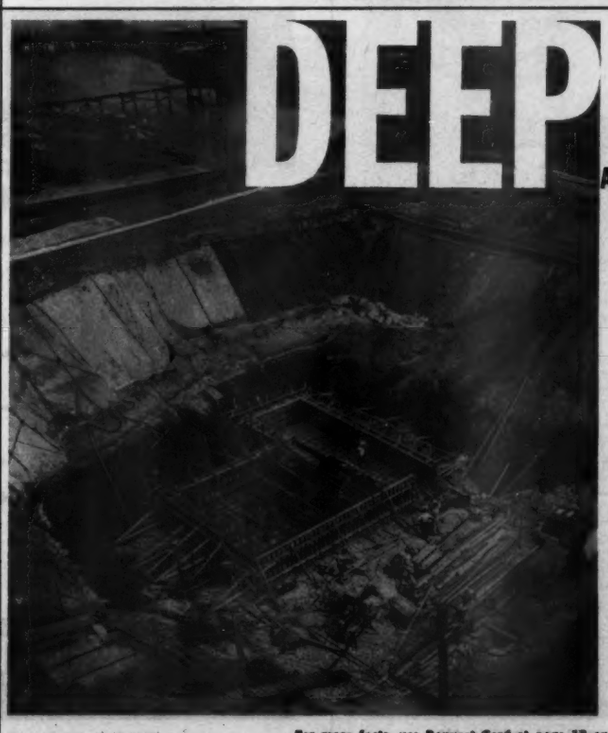
DEEP AND DRY



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For more facts, use Request Card at page 18 and circle No. 428

Questions concerning distributor-manufacturer relations are answered by a panel that includes: A. E. York, Clark Equipment Co.; J. J. Cooligan, Eastern Equipment Sales, Inc.; J. W. Hardesty, Baldwin-Lima-Hamilton Corp.; H. M. Doolen, Western Construction Equipment Co.; H. L. Kalousek, Air Placement Equipment Co.; and J. W. Schoen, Contractors Equipment & Supply Co. Hardesty and Doolen were co-chairmen.

John A. Volpe, president-elect of the Associated General Contractors, addresses the AED convention.

(*Continued from preceding page*)

"The No. 1 reason for the criticism of the highway program is, undoubtedly, that the program is big," he said. "A program involving spectacular amounts of materials and money is a program certain to attract critical attention. . . .

"Another aspect of the Interstate System which attracts criticism," Prentiss stated, "is the fact that, in addition to controlled access, the design standards for these highways are based upon . . . traffic needs for the year 1975. . . .

"Many people," he declared, "found it difficult to understand how a program established only three years ago could have encountered serious financial troubles so quickly." (That is the fight in the last session of Congress that resulted in a 1-cent increase in the gasoline tax.) "Actually, financial trouble was written into the 1956 Highway Act and could not have been avoided except through many timely Congressional action."

He also pointed out that Congressional investigation into extrav-

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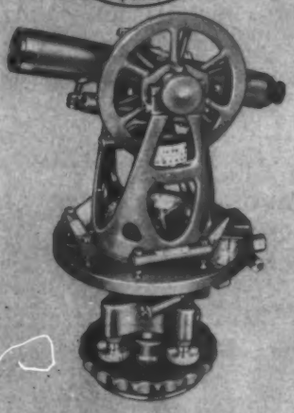

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UNIVERSAL
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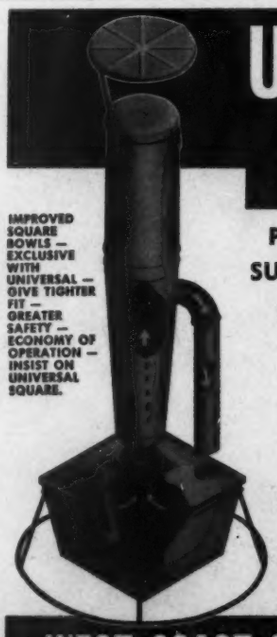

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SURE FIRE TO BE YOUR CHOICE

Here's Why . . .

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For more facts, use Request Card at page 18 and circle No. 430

Jan Peters decorates the Condex display booth where Andrews portable conveyors are displayed.

Talented Ruth Marion entertained at the Early Birds' breakfast with songs, dances, and some shaking of maracas.

AED delegates at the Early Birds' breakfast give a loud round of applause for the acrobatic antics of the Reberti Trio.

distributor doings

nce and fraud in the highway rogram have shaken the public's nfidence.

According to Prentiss, "The trend running strong in the direction of otility toward the highway pro- am. Unless the trend is reversed, e criticism will become louder and onger. The whole future of the ighway program is threatened."

To stem the tide of public indif- rence, he declared, it is necessary keep the people informed on the

(*Continued on next page*)

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THE COLUMN CLAMP THAT WORKS LIKE A SQUARE
• CUTS COST
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REDUCE ROCK BREAKING COSTS WITH THIS BIG — TOUGH TEAM!

The BIG, brawny Greenville Rock Ripper is a perfectly balanced mate for the powerful I.H. TD-25 Tractor! Heavy-duty, strong alloy steels . . . "power-matched" hydraulic system . . . new, job-rated shanks and points combine in this new Greenville Ripper to produce unequalled performance with trouble-free operation, even to 48" penetration.

Greenville also builds "power-matched" rippers for I.H. TD-14, TD-15, TD-18, TD-20 and TD-24 tractors. Write for: Bulletin GR 25-160. Greenville Steel Car Company, Greenville, Pennsylvania.

For more facts, use Request Card at page 18 and circle No. 432

distributor doings

Glamorous Rosemary Meyer demonstrates a new-model Universal salamander for West Coast Steel Products.

At the Condex exhibit, the Ottawa Steel Division of Young Spring & Wire Corp. introduces its new line of Commando prime movers.

At the Rice Pump display in a hotel suite, compa president R. D. Houghton points out features of a unit to Paul Hoofnagle and Ray Smith.

(*Continued from preceding page*)

progress of the highway program and the benefits derived from better highways. This means a long-range public-relations program.

Steps have already been taken to get that program under way, Prentiss said. The ARBA started the program by organizing the Public Information Advisory Committee. This committee, which has recently completed its work, has laid the foundations for the Better Highways Information Committee.

"The Better Highways Information Committee is not a function of ARBA," he said. "It is not a function of AED. It belongs to the highway industry, and must be supported by every group that is interested in seeing the highway program go forward."

Volpe

Like Fitzpatrick, John A. Volpe, president-elect of AGC, also expressed concern about the danger of distributors extending too much credit to unreliable contractors.

He said that "the problem at t moment appears to be the fact th too many persons, not qualified, a able to obtain easy credit and b come unhealthy competition. In ef fect, we are financing our competi tion."

Volpe praised both state highwa departments and contractors fo handling the greatly increased vo ume of work on the Interstate Sy tem. He was dismayed by the criti cism directed at the highway progra by politicians and certain public tions during recent weeks.

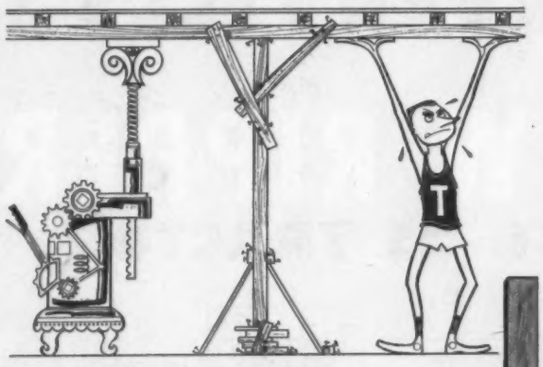
Benson dies

Jewel Benson, who was elected n tional president of AED on Janua 27 in Chicago, died at his home Houston, Texas, on February 19 fro a heart attack at the age of 60. He w president of the Benson Tractor C Houston.

Others elected to office in the Ass

Lotsa Ways to Shore...

AND YOU MAY PREFER ONE OF THESE SYSTEMS:



But If You've Never Tried

BEAUTIFULLY SIMPLE

ELLIS METHODS

for Constructing Suspended Reinforced Concrete Floors

(and beams, ramps, arches, bridges, etc.)

You've Missed Something!

TRY ELLIS SHORES

"Up and down" faster — no waste — great savings of time, labor and materials! Re-use shores and parts indefinitely.

You can NAIL INTO these wood members at any point, although little or no nailing is normally required.

A simple one-hand jack adjusts height; clamps loosened by taps of a hammer.

Write letter or mail coupon requesting information or free trial offer card.

Ellis Mfg. Co., Inc., 211 N. W. 4th St.
Oklahoma City, Okla.
Send me, without obligation:
☐ Complete information on Ellis Methods.
☐ Free trial offer card for shores and parts.
Name _____
Address _____
City _____ State _____

ELLIS MFG. CO.
INCORPORATED

For more facts, use coupon or Request Card at page 18 and circle No. 433

LOOK TO FLINTKOTE FOR ALL YOUR PAVEMENT SEALING AND REPAIR PRODUCTS...

Send today for technical data sheets on the following:

● **FLINTSEAL***—hot poured rubber asphalt compound—tough, long lasting . . . bonds perfectly through cycles of slab expansion and contraction.

● **H-100**—Super effective, polymer type joint sealer (cold applied)—oil and chemical resistant; sets quickly, bonds perfectly at extreme temperatures. *No flow*—even in vertical joints. Ideal for sealing bridges.

● **FLINTAR***—Coal Tar Pitch Emulsi (brush or squeegee applied)—do bles the life of bituminous pavemen by protecting against moisture in filtration and oxidation. Beautifie too!

● **FLINTCRETE**†—Exciting new poly sulfide/epoxy cement bonding co pound. In several formulations f pavement restoration and repair.

Also ask about Flintkote's hot poured and Cold-applied Jet Fuel Resistant Joint Sealers. Complete pavement restoration specifications are available. Write: The Flintkote Company, P. O. Box 157, Whippany, New Jersey.

FLINTKOTE

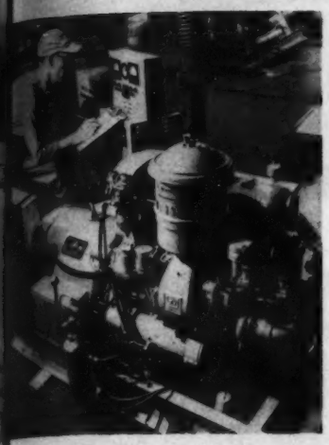
*Reg. U. S. Pat. Off.
†A trademark of The Flintkote Company

Manufacturer of diversified products for home and industry

For more facts, use Request Card at page 18 and circle No. 434

distributor doings

r 1960: H. J. Mayer, senior vice presi-nt; R. F. Newlin, vice president; rton Blalock, Jr., vice president; Boyd Somerville, Canadian vice president; and W. R. Parnell, treasurer. P. D. Hermann will continue as executive secretary of the association. THE END



A STANDBY GENERATING SET for a national-emergency shelter is checked over by a technician before installation in Standard-Vacuum Oil Co.'s executive office building at Harrison, N. Y. The GM diesel unit—supplied by Griffin Equipment Corp. of New York City and Lodi, N. J.—will generate 50 kw and will switch on automatically if the regular power should fail. The engine installation operates on regular oil-burner fuel and is equipped to be cooled by water drawn from private wells. If air-conditioning equipment is functioning, water used by it can also be used to cool the diesel, but if it is not functioning, a special thermostat in the engine will route water to the diesel's heat exchanger.

exas dealer for L-W

Dalworth Machinery Co., 10301 ndy Trail and Highway 114, Dallas, s been appointed a distributor for e complete line of earthmoving, ading, and heavy hauling equip-ent produced by LeTourneau-West-ghouse Co., Peoria, Ill. The dealer ill cover the Dallas area.

wik-Mix appoints

Kwik-Mix Co., Port Washington, is., a division of Koehring Co., has ppointed Denver Air Machinery Co., 21 Blake St., Denver, a distributor r its complete line of construction achinery. The dealer will cover Colorado east of the Continental Divide and Albany and Laramie counties in southeastern Wyoming.

August Honeck & Son, Malinta, Ohio, will sell and service the complete Kwik-Mix line in the 5-county area in northwest Ohio.

Parker-Hannifin divisions name distributors

The Parker Fittings & Hose Division of Parker-Hannifin Corp., Cleveland, has appointed Industrial Technical Sales & Service, Inc., 650 Park Ave. W., Mansfield, Ohio, a distributor for its industrial hose and fittings.

W. E. Thew Supply Co. Inc., 339 S.

(Continued on next page)

Triple duty POWER/WELD delivers

3 BIG profit opportunities

INSTANT DC WELDING repairs can be made on the job. Avoids labor loss, down time, and expensive replacement parts.

POWERS LIGHTS, TOOLS, Etc. in the low ranges. No need to return to welder to make adjustments.

3. EMERGENCY 5 KW 110/220 v. FULL TIME AC POWER is available when not welding. Keeps construction, shop equipment running if you are in remote sites, or if high line power fails.

HOBART BROTHERS CO., BOX 830, TROY, Ohio. Phone FE 2-1223

The PERFECT Combination Hobart Welders and Hobart Electrodes . . . guaranteed controlled quality from raw materials to finished product. Try them and see.

HOBART BROTHERS COMPANY, BOX 830, Troy, Ohio
Yes, I'd like to know more about these Hobart welders:
☐ 200 amp. "Power/Weld" ☐ 300 amp. Standard Gas Drive
☐ 250 amp. "Mainliner" ☐ 200 amp. Small Shop "Husky Boy"
Other type welders_____
Name_____
Address_____
City_____ Zone____ State_____

For more facts, use coupon or Request Card at page 18 and circle No. 435

The Campbell Sliding Cab . . . for models HU, HH, HO, H30R, H50, H70, and H90 "Payloaders"!!!

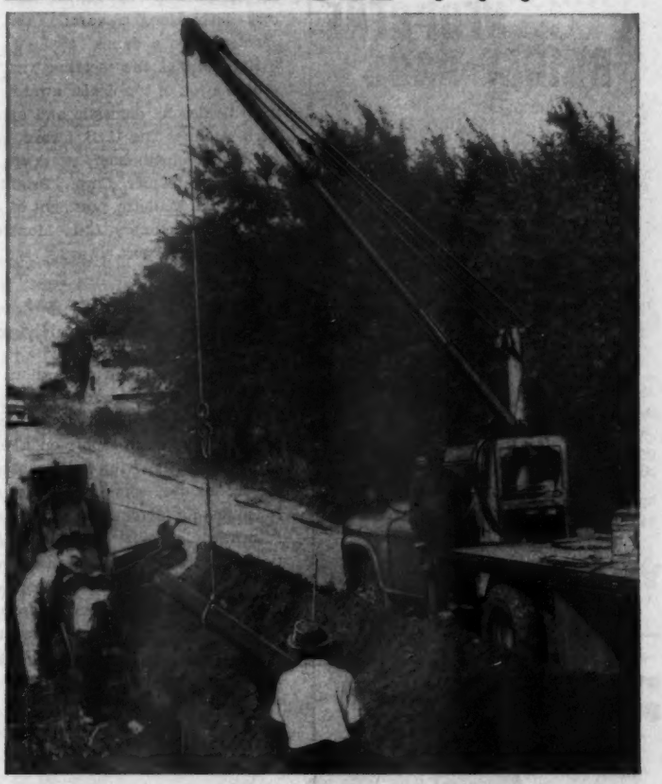
This sturdy, modern design offers features long desired by "PAYLOADER" operators, among them—Sliding top, ball bearing mounted on steel channel—Rubber seals to insure weather tightness—Permanently mounted access ladder—Rear view mirror—Tinted safety glass windshield and skylight.

Investigate this completely new design in "Payloader" Cabs by calling your "Payloader" distributor, or contact

CAMPBELL DETACHABLE CAB CO.
WAUCONDA, ILLINOIS

For more facts, use coupon or Request Card at page 18 and circle No. 436

DAYBROOK . . .



"Power Loader places 10" cast iron pipe in trench . . . ONE MILE PER DAY"

—E. E. FARROW COMPANY, DALLAS, TEXAS

"The Daybrook Power Loader is almost perfectly matched to our trencher. It is easier on our operator than other cranes we have used and he can see what he is doing better"—comments superintendent A. L. Lamascus, E. E. Farrow Co. "In laying sewer and drainage lines, the Power Loader will average 1,000 feet per day."

The loading, unloading and placement of pipe is only one of many jobs that the POWER LOADER does easier, faster, and safer. On the handling of paving forms and fabricated steel sections, precast concrete, concrete block and brick, cut stone and marble, or any building material, the Power Loader will cut costs—make more money, and at a low initial investment, too.

Loads can be placed at heights, at ground level, or in trenches . . . within 360 degrees swing of the truck . . . anywhere a truck can go. Investigate "power loading" for construction work, today!

Daybrook—manufacturer of quality hydraulic truck equipment for the construction industry—

Aluminum and Steel
DUMP BODIES

Telescopic and Underbody
HYDRAULIC HOISTS

POWER LOADER
(truck-mounted crane)

POWER GATE®
(hydraulic tail gate)

Write for FREE Literature

YOUNG SPRING & WIRE CORPORATION

DAYBROOK HYDRAULIC DIVISION
BOWLING GREEN • OHIO

distributor doings

Broadway, Green Bay, Wis., will handle Crown compressed-air units, produced by the Hannifin Co. division.

M & M Supply Co., 2716 Mockingbird Lane, Dallas, has been named a franchised distributor for Crown air regulators, filters, and lubricators, and for Parker industrial tube and hose fittings.

Depatie Fluid Power Co., Inc., 234 S. Burdick, Kalamazoo, Mich., has been appointed a franchised distributor for Parker industrial hose and re-usable fittings made by the corporation's Parker Fittings & Hose Division.

Paul Bunyan and Babe the blue ox show up in the parade held in Escanaba, Mich., during the thank-you celebration for Harnischfeger Corp. and its dealers. Fireworks, an ice carnival, and a lumberjack breakfast were high spots of the celebration. P&H top dealer awards were presented in conjunction with the whoop-up, held just prior to the AED annual meeting in Chicago.

Town thanks P&H for economic boost

The residents of Escanaba, Mich., gave a rousing thank-you celebration to 350 dealer representatives and executives of Harnischfeger Corp., Milwaukee, for three days prior to the AED convention. The reason for the thanks dates back 12 years when Harnischfeger helped lift the community from a localized depression and changed it into an industrial center.

The celebration included sleigh rides, fireworks, a lumberjack breakfast, an official city welcome, a factory inspection, a parade, an ice carnival, and a dance.

Highlight of the meeting was the presentation of top-dealer awards for record sales by domestic and export P&H dealers. The U. S. award went to Paul Eschenheimer, president of the Eschenheimer Corp., Brighton, Mass. J. H. Mallette, president of Accessories Machinery Ltd., Montreal, received the export award.

Caterpillar dealers get information on new lines

At a recent series of sessions in Phoenix, Ariz., Caterpillar dealers from all over the U. S. and Canada received a detailed report on a wide variety of earthmoving equipment and diesel engines, some of which are scheduled for introduction in the near future while some are still in the testing stages. The conferences were divided into one day of indoor sessions and one day of machine demonstrations at the company's research and proving grounds in the desert west of Phoenix.

Beaver-Advance honors its top distributors

Riverside Sales Contractors Equipment Inc., Brookfield, Ill., won first award as 1959 Distributor-of-the-Year for Beaver-Advance Corp., Ellwood City, Pa. B-A made the award at the annual convention of the Associated Equipment Distributors.

The manufacturer of tubular-scaffold and material-hoisting equipment also presented certificates of merit to K. C. Construction Supply Co., Denver, and E. L. Wyman Construction Co., Concord, N. H.

B-G dealer conference for U.S.-Canadian firms

Barber-Greene Co., Aurora, Ill., held a 2-day management conference, prior to the AED annual meeting, for nearly 200 representatives of its U. S. and Canadian distributors. The meetings emphasized new product developments. At the windup of the session, plaques for the "Top Ten" in 1959 sales were awarded.

SERVICISED NEOPRENE BRIDGE PADS

• ECONOMICAL
• EFFECTIVE
• REQUIRE NO MAINTENANCE

Provide smooth, uniform load transfer from bridge beams to substructure . . . permit free beam expansion, contraction, and rotation.

Servicised Neoprene Bridge Pads are specially designed for use as bearing plates for precast, pre-stressed concrete bridge beams. Neoprene Pads have no moving parts and their ability to give and take in shear permits absorption of beam expansion, contraction, and rotation.

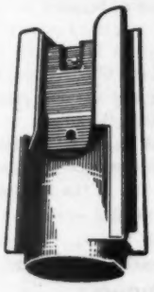
High resistance to deterioration and the elimination of maintenance in any form, make Servicised Neoprene Bridge Pads the most durable and economical bridge pads available today.

Write for complete details and material specifications

SERVICISED PRODUCTS CORPORATION
4051 W. 65TH STREET • CHICAGO 29, ILLINOIS

For more facts, circle No. 437

DEPENDABLE SEMI-STEEL PILE HAMMERS



PILE DRIVER HAMMERS
Well designed of tough close grained semi-steel to give maximum impact for easy reeving. Can be adopted to fit present leads. Fast service in sizes 2000 lbs. to 4000 lbs. in 250 lb. increments.

FOLLOW BLOCKS
Sturdy semi-steel. Quick delivery on all sizes for hammers weighing 2000 lbs. to 4000 lbs.

SWINGING LEADS One Section All-Steel
Lengths 20' 25' 30' 35' 40'
Maintain your pile drivers at top efficiency with this low cost replacement equipment.

Buy Direct From Manufacturer and *Save!*

WRITE NOW . . . for detailed literature and Low Factory Prices!

Sioux City Foundry & Boiler Co.
East 8th & Division SIOUX CITY 2, IOWA Phone 5-7967

For more facts, use Request Card at page 18 and circle No. 438

BROWNHOIST
open-type grab and link-type buckets in capacities from ½ to 3 cubic yards

direct from factory-to-you for less money

Write for catalog No. 574

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN

For more facts, use Request Card at page 18 and circle No. 439

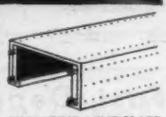
Penn Machinery gives scholarship to Clarkson

A $1,500 scholarship has been established at Clarkson College of Technology by The H. O. Penn Machinery Co., Inc., New York City, for qualified students starting the construction-equipment-distribution or civil-engineering program. In administering the scholarship, the Potsdam, N. Y., college has been requested to give preference to relatives of the dealer's employees, then to relatives of customers who reside in the company's territory.

DEALER ACHIEVEMENT AWARDS, based on 1959 sales performance as compared to territory potential, were presented by Champion Mfg. Co., St. Louis, to three of its dealers at the AED convention. Receiving the awards are, left to right, Carlisle Myers, vice president of Central Supply & Equipment Co., Danville, Ky., third place; Ben Jenkins, president of Standard Equipment Co., Kingston, Pa., second place; and M. J. Lyons II, vice president of Lyons Machinery, Little Rock, Ark., first place. Asher Powell, vice president of Standard Equipment Co., looks on as William V. Loncaric, Champion sales manager, awards the plaques.

S-A SECTIONAL BELT CONVEYOR with BENT PLATE DECKING *Simplifies Erection!*

- As few as eighteen high strength bolts rigidly fasten all sections for simplest and easiest conveyor erection ever.
- Four high strength bolts fasten head assembly . . . 8 bolts join intermediate sections . . . and 6 bolts connect tail assembly.
- Combines quality-engineered conveyor components provided in no other pre-engineered conveyor.
- Available in 18", 20", 24", 30" and 36" belt width conveyors. Delivered from stock. Competitively priced.



EXCLUSIVE BENT-PLATE DECKING ASSURES . . . easy installation of components plus protection for return run of belt.

S-A

WRITE FOR BULLETIN 458

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
97 RIDGEWAY AVENUE • AURORA, ILLINOIS
PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA
CLARKSDALE, MISSISSIPPI • BELLEVILLE, ONTARIO

For more facts, circle No. 441

ALL NEW! GOOD ROADS "ODELL" SPREADER

...for asphalt and aggregate spreads up to 8-inch depths

Operated by only two men, contractors report savings up to 50% on average jobs with the "Odell". Spreads asphalt, gravel, coarse slag or stone, limestone, cinders, and other base material (up to 4" in diameter) to 8" in depth. Adjustable for spread widths up to 10 feet.

Accurate spread depth is controlled by the exclusive "floating" strike-off bar with new crown adjustment, mounted on runners independent of the roller and hopper.

Can be hitched to practically any standard size or model dump truck in seconds. For further information write:

GOOD ROADS MACHINERY Co.
MINERVA, OHIO

For more facts, circle No. 442

San Diego Equipment opens warehouse, office

Construction of a new warehouse and sales office at 5901 Mission Gorge Road, San Diego, Calif., has been completed by San Diego Equipment & Supply Co. Specializing in construction, drilling, and rock excavation equipment, the newly formed firm represents Gardner-Denver Co., Bay City Shovels, Inc., and the Rock Bit Division of The Timken Roller Bearing Co.

The dealer's parts and service department will provide 24-hour assistance on customer emergency calls. Field technical assistance will also be available to customers.

Euclid dealers elect; firm presents awards

A. L. McFarland, vice president and general manager of Blackwell-McFarland Euclid Co. of Birmingham and Mobile, Ala., is the new chairman of the National Euclid Dealers Association. He succeeds H. W. Nash of Nash Euclid Equipment Sales Corp. in Salem, Va.

The group also elected H. J. Traher of Standard Equipment Co., Kingston, Pa., its new secretary.

The Euclid Division, General Motors Corp., Cleveland, presented Top Batter awards to five of its dealers. The awards were for a sales contest that ran for the entire year of 1959. The awards were based on market penetration by number of customers sold rather than on sales volume.

First winner was Ray Long Equipment, Inc., Columbia, S. C. The other four top batters are Euclid-Mississippi, Inc., Jackson, Miss.; Conley-Lott-Nichols Machinery Co., Dallas; Mitchell Distributing Co., Inc., Charlotte, N. C.; and Nash Euclid Equipment Sales Corp., Salem, Va.

Le Roi distributor adds

Atlantic Tug & Equipment Co., Inc., 1801 Erie Blvd., Syracuse, N. Y., a distributor for the Le Roi Division of Westinghouse Air Brake Co., Milwaukee, has added Le Roi's S2 line of large stationary air compressors. These will be handled at the dealer's headquarters and branches at Albany, Lake Placid, Massena, and Whitesboro, N. Y.

Slurry-Seal Spreader

For *FAST, UNIFORM* surface sealing use the rugged, adjustable TARCO Slurry-Seal Spreader. *Fills* and *seals* cracks. *Levels* minor depressions. *Skid-proofs* surfaces.

Tarco's Slurry-Spreader is bolted steel construction . . . adjustable in widths from 12 feet to 6 feet. Two *slurry-leveling blades*: one semi-rigid; one flexible rubber adjusts to pavement contour by 7 quick-acting ratchets. Completely equipped: heavy *drag chains*; 2 pneumatic-tired *traveling wheels*; *sprinkler*; telescoping *tow bar*; operator's *cat walk*.

For more spreader details—or more information about the Slurry-Seal Method—see your Tarco dealer or write to us.

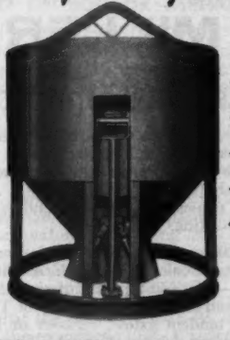
TARRANT MFG. COMPANY
31 Jumel Place, Saratoga Springs, N. Y.

For more facts, circle No. 443

NEW! JOHNSON® *light-weight* CONCRETE BUCKETS

SIZES:	NET WEIGHT*
½ cu. yd.	355 lbs.
¾ cu. yd.	455 lbs.
1 cu. yd.	700 lbs.
1½ cu. yd.	840 lbs.
2 cu. yd.	1075 lbs.

*approx.



Light in weight, low in cost, this all-new series of concrete buckets from Johnson gives high ratio of capacity-to-weight. Makes each pour more profitable for you! Features: all-welded steel hopper, frame. All working parts above discharge point and well within bucket outline—protected during work, storage, shipment. 50° slope of cone bottom gives complete discharge of medium-slump concrete. Short-stroke, easy leverage handle. Double-clam gates. Stainless steel shafts in nylon bearings. Write today!

— — — —Mail to C. S. JOHNSON CO., Champaign, Ill.— — — —

Send more information on ..... cu. yd. light-weight concrete bucket

NAME _____

COMPANY _____

STREET _____ J910 CBE

CITY, STATE _____

JOHNSON

CHAMPAIGN ILLINOIS • STOCKTON CALIF

For more facts, use coupon or circle No. 444

Construction Camera

Excavation for the Calumet River Lock, part of the U. S. Army Corps of Engineers' $200 million Calumet-Sag Navigation project in Chicago, is handled by Lima draglines. MZ32 sheet piles, supplied by L. B. Foster, are used in the single-wall cofferdams at each end of the lock.

In a rocky section along the Sprainbrook Parkway contract in Yonkers, N. Y., a 3-yard Manitowoc Model 3600 shovel is used by Poirier & McLane, New York City, for excavation. The contract calls for some 3 million yards of rock and earth excavation.

History of roads from ancient to present time topic of books

■ "Public Roads of the Past," available from the American Association of State Highway Officials, comes in two volumes. Volume 1 discusses roads from 3500 B. C. to 1800 A. D. It covers the oldest road in the world, Roman road-building tools, the transition from animal to mechanical horsepower, the origin of our engineering measures, the development of surveying instruments, and highways of Middle America.

Volume 2, historic American highways, concerns important roads that were built from 1539 to 1945. Maps, charts, and pictures accompany each chapter. The early use of some modern road surfaces is also described.

Priced at $2.50 per set, the books may be purchased from the AASHO, 917 National Press Bldg., Washington 4, D. C.

Koehring and Parsons hold sales conferences

■ The Koehring and Parsons Divisions of Koehring Co., Milwaukee, will hold regional sales conferences on March 14 and 15 in New York City, and on March 17 and 18 in Pittsburgh. Purpose of the conferences is to provide the sales personnel of Koehring and Parsons distributors with the latest information on the equipment manufactured by the two divisions.

W. B. Dickerson, sales manager, is heading the Koehring Division sales group, which also includes P. E. Cunningham, A. V. Cossens, and W. Fisher. Each Koehring Division district representative will be present at the conference held in his territory.

The Parsons sales group will vary from conference to conference, including at various times sales manager R. E. Bansemer and district representatives John Harvey, L. D. Ross, R. H. Danford, and Tom O'Donnell.

how to cover more jobs WITH FEWER rigs

JUST RUN 'EM ON

RUN 'EM OFF

a MILLER *Tilt-Top*

...it takes ONE man only TWO minutes

Fast, easy, ONE man loading and hauling . . . gives you new job-to-job speed for all kinds of rigs . . . helps get more on-the-job *productive time* from both operator and machine. Result: — you can fast-shuttle rigs between jobs . . . often saving the need to duplicate expensive equipment and *man hours lost* in slower loading and hauling.

The 30,000 capacity OTG shown above, loading an INSLEY crane, has a massive oak decked platform 8 ft. x 16 ft. — 20 ft. long if you want it, — providing plenty of room for backhoes or draglines, big crawlers and other rigs. A variety of Tilt-Top models equipped with single or tandem axles . . . over or between-the-wheels platforms speed between job shuttling of all sorts of rigs from 4 to 22 tons!

NEW CAPACITY RANGE 4 TO 22 TONS

See your MILLER distributor or write for FREE literature to:

Miller Tilt-Top Trailer Inc.

456-G South 92nd Street, Milwaukee 14, Wisconsin

*F.O.B. Milwaukee, Wis. Complete with platform and tires. Brakes and optional equipment extra
*Plus 10% Federal Tax

For more facts, use Request Card at page 18 and circle No. 445

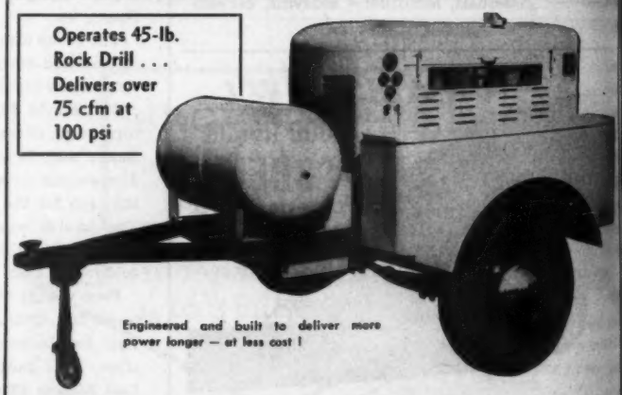
Fast, Dependable

AIR POWER

GENERAL SUPPLY'S

Porta-Air 75 COMPRESSOR

Operates 45-lb. Rock Drill . . . Delivers over 75 cfm at 100 psi



Engineered and built to deliver more power longer — at less cost !

- Industrial engine.
- Stainless steel, heat-treated beryllium copper compressor valves for longer life.
- Instruments, controls conveniently grouped.
- Working parts readily accessible.

SKID-MOUNTED Models as low as $1995 f.o.b. Kansas City; $2045 f.o.b. Sacramento
Smaller compressors available.

COSTS LESS TO BUY, MAINTAIN!

The Porta-Air 75 develops enough power for nearly all your needs, yet costs far less than big, bulky units. Evenly spaced power impulses give smooth air flow—enough for 80-lb. paving breaker or three tampers, or two clay spades. Consumes only 1½ gals. gas per hour. Fenders and tool boxes optional.

WRITE OR CALL COLLECT for complete information

Industrial Compressor Division

GENERAL SUPPLY COMPANY

1920 McGee Trafficway, Kansas City, Missouri — Phone HArrison 1-3477 — TWX: KC 288
1820 "D" Street, Sacramento, California — Phone Gilbert 3-5928 — TWX: SC-45

We invite inquiries for jobber-distributors

For more facts, use Request Card at page 18 and circle No. 446

Five contractors, using six Lorain Moto-Cranes for the job, took on the work of lowering steel-plate roof onto a 126-foot-diameter, 30-foot-high tank at a feed lot near Kerman, Calif. Each of the Moto-Cranes is using a 60-foot boom to handle its share of the load.

Clay soil for use as binder to mix with sand for an oil-mat paving job in Nebraska is loaded out to a truck by a Model HU Payloader. The rig handles an average of 65 to 75 truckloads per 8-hour day. Five 10-yard haul rigs are being used for delivery on this 7-mile secondary-highway contract near Bartlett.

Delaware Memorial Bridge

To the Editor:

CONTRACTORS AND ENGINEERS

All of us have been very much impressed by the February editorial, "Construction Pays Off."

We are particularly interested in your use of the Delaware Memorial Bridge as a successful venture, since we were consulting engineers on this project. As you may know, legislation is now in draft form to authorize the building of an adjacent bridge. Each would carry 4 lanes of traffic in opposite directions. It is undoubtedly true that the present bridge would be well overloaded by the time the second bridge can be completed, since the traffic increases substantially with any reduction in toll.

Very sincerely yours,
Enoch Needles, president
Howard, Needles, Tammen & Bergendoff
New York City

Bridge of unique design to span the Ohio River

■ A huge 1,600-foot steel bridge, the only one of its kind in the United States, will be built over the Ohio River near Louisville, Ky. The Structural Steel Division of The R. C. Mahon Co., Detroit, was awarded the contract for the bridge, totaling nearly $6.4 million, by the Indiana State Highway Department.

The bridge is of a unique, tandem tied-arch double-deck design—a design that requires fabrication methods seldom used. Another bridge using this design is the cantilever-truss structure that was built to span the Carquines Strait in California.

The bridge over the Ohio River will be a link in Interstate Highway 64 that stretches from Richmond, Va., to St. Louis by way of Louisville. It will span the Ohio River between New Albany, Ind., and Louisville.

The steel superstructure of the bridge will be fabricated in Detroit and shipped from there. It will consist of two 800-foot spans, each double-decked. Each deck will carry a 42-foot-wide triple-lane road with safety walks at each side.

When completed in late 1961, the bridge will contain 15 million pounds of fabricated structural steel; 1,250,000 pounds of reinforcing steel; and 8,000 feet of aluminum railing.

The federal government is paying 90 per cent of the costs, and Indiana and Kentucky each pay 5 per cent. When fully completed, the bridge will cost $15 million.

Consulting engineers on the job are Hazelet & Erdal, Louisville; Roy Ryan & Sons, Evansville, Ind., holds the $1.5 million substructure contract.

Timken division renamed

■ The Canadian manufacturing operations of The Timken Roller Bearing Co., Canton, Ohio, have been renamed Canadian Timken, Division of The Timken Roller Bearing Co. The change is consistent with the firm's international-operations policy of identifying the manufacturing divisions of the company with the country in which it operates. The division produces bearings and rock bits.

T. W. Clift is general manager of the Canadian division.

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Essick VR-28-W Self-Propelled Vibrating Compactor on Golden State Freeway

COSTS CUT IN HALF . . .
PRODUCTION TRIPLED . . .
SPECIFIED DENSITIES EXCEEDED . . .

ESSICK 28" VIBRATING COMPACTOR OUTPERFORMS OTHER EQUIPMENT ON SOIL OR ASPHALT

Charlie Brown of the Chas. T. Brown Construction Company states:
"We were working on the Golden State Freeway in Los Angeles, compacting backfill around bridge abutments and drainage pipes. At the start of the job, compaction costs were running about $1,300 per month per compaction unit which consisted of a compressor and three pneumatic tampers.

"Having successfully used Essick Vibrating Compactors on other projects, we felt that we could get better densities at less cost in the confined areas of this job with the Essick 28" self-propelled vibrating model.

"We put the Essick VR-28-W to work and cut monthly costs to about $650 per compaction unit (about one-half), tripled our production, and exceeded our best past compaction performance. Being self-propelled, the Essick 28" Vibrating Compactor is just the ticket for backfill operations on soil and in hard-to-get-at locations. It gives the most compaction at the least expense, and exceeds specifications in record time."

Many Contractors are finding that the 865 lb. VR-28-W, with its High Frequency Vibration, exceeds the compaction of a sixteen-ton static roller on soil. This multiple purpose tool has also revolutionized highway maintenance by putting down better asphalt patches at greatly reduced costs. Carrying hooks make it completely mobile, and being self-propelled, it will go just about anywhere compaction is required.

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For more facts, use Request Card at page 18 and circle No. 448

Construction Camera

Converting the Texas Tech stadium from field to bowl involves lowering the floor 27 feet and moving one side of the stadium back so that seats can be built below the level of the present stands. An 11-yard Hancock elevating scraper is one of the rigs moving 3,000 yards of dirt daily on the job.

An all-steel school—including walls, partitions, and roof-deck panels—is something new for Los Angeles. Wall columns have been erected for the office and library building, and workmen are bolting roof beams in place. Bolting is used when possible to keep field welding at a minimum.

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For more facts, use Request Card at page 18 and circle No. 449

Huge land caisson demands careful concrete placing

■ A tricky problem in concrete technology—placement of concrete for a huge land caisson in which cold joints could not be tolerated—has been solved at Deer Island in Boston Harbor by restricting the height of layers in each placement to 18 inches and using an initial set retarder in all concrete. The caisson, with a circumference of 399 feet and walls that are 9 feet thick, will become an underground building housing a sewage pumping station. The problem was how to make a complete pass around the circle before concrete set.

By using three cranes—a Manitowoc Model 4500 and two Model 2800's—and by limiting the height of the layers, placement was held to about 2½ to 3 hours for each pass. Then, to make certain no concrete would begin to set, and to insure against equipment breakdown, an initial set retarder was used. It kept concrete plastic for at least four hours.

Each 18-inch layer was vibrated with the one beneath it, eliminating any question of cold joints and producing concrete of monolithic nature.

Prefabricated metal forms were 12 feet high. Each 12-foot lift cured seven days to develop 2,500 psi and allow the forms to be moved higher for the next placement. Between lifts two polyvinyl chloride waterstops were used.

The 120-foot-high caisson cut its way, like a giant cookie cutter, into the ground under the weight of successive concrete placements. The cutting edge was a 125-ton structural steel ring that tapered in cross section to 18 inches at the bottom. A Caterpillar D9 dozer excavated the fill in the center to control the rate of drop.

The side walls of the caisson are

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For more facts, use coupon or Request Card at page 18 and circle No. 450

of the first phase of the Sacramento Municipal Utility District's hydroelectric development on the upper American River includes the 21,000-foot Jaybird tunnel. A Joy JSL loader works at the upstream heading. The project will include 10 dams, 7 power-houses, and 23 miles of tunnels.

Base material on a road leading to the Fairview Elementary School in Lafayette, Calif., is graded by a Huber-Warco maintainer. This is one of the jobs that is being handled for the school districts located in the Berkeley, Calif., area by G. Ferrabee Co., Berkeley.

(*Construction Camera continued on page 186*)

complete, the top being flush with ground surface and the bottom ded for the last 10 feet into shale. nt 14,000 yards of concrete has n placed in the walls, and at least d much again will be placed as a t at the bottom and as a 2-foot crete liner inside the caisson.

In addition to its great size, the sson is unique in that it not only ves men and equipment to work a great depth but also becomes the shed structure itself. It will house erage pumping station that will eive raw sewage from the Boston tropolitan area through two tun-s—one 10 feet and the other 12½ t in diameter—that have been ed through the shale under the rbor. The tunnels are 200 feet be-r the mat, and each terminates in shaft rising to the surface. Intake nels are being bored 30 feet below e caisson to each of these shafts, to nect with intake manifolds that l be embedded in the concrete mat. Since gravity will bring the sewage el only to within 70 feet of ground level, pumps had to be located below the mark. This is the reason the caisson was built. Ten pumps located on the mat will have a maximum capacity of 800 million gallons per day. Watertight walls were required in the caisson to keep out ground water, and the great weight of the caisson—more than 50,000 tons when completed—was needed for the sinking job to counteract the buoyant effect of ground water.

The Deer Island plant is the second treatment plant in Boston Harbor. Another now in operation is located at Nut Island. Both "islands" are connected to the mainland, and concrete for the Deer Island project is being brought overland by ready-mix trucks.

Consultants associated in a joint venture are Charles A. Maguire & Associates, Boston; Elson T. Killam Associates, Inc., Millburn, N. J.; and Greeley & Hanson, Chicago. The contractor is the Perini Corp., Marine Division, Boston. Ready-mix concrete is supplied by the Boston Sand & Gravel Co., Cambridge, Mass.

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For more facts, use Request Card at page 18 and circle No. 452

In this 137-foot-deep cut—the biggest on a 1½-mile stretch of new roadway bypassing Frankfort, Ky.—Gardner-Denver Air Tracs, powered by Ingersoll-Rand 900 and 600-cfm compressors, sink 3½-inch blast holes. Good breakage was obtained with a 7×8-foot drill pattern and the dynamite and ammonium-nitrate explosive combination.

Tight drill pattern best in this rock cut

A small equipment spread turned in an efficient job on 1½ miles of Thornhill-Greenhill Road bypassing Frankfort, Ky. Ralph E. Mills Co., Inc., Frankfort, handled the $790,876 contract that called for removal of approximately 400,000 cubic yards of material—mostly rock—from three major cuts along the roadway alignment.

Compact spreading

Mills used three Gardner-Denver Air Tracs, powered by Ingersoll-Rand 900 and 600-cfm compressors, to sink the blast holes. This compact spread, including a Northwest 80-D 2½-yard shovel, worked easily in the cuts.

The deepest cut was 137 feet deep, 86 feet wide at the bottom, and 140 feet wide at the top. The next cut, 104 feet deep, had the same bottom and top widths as the larger cut. A third cut, only 37 feet deep, was 86 feet wide at the bottom and 120 feet wide at the top. Each of the cuts has side slopes of ¼ to 1 and, being in soft limestone, required careful blasting to prevent excessive damage to the exposed surfaces.

Bench formed

The contractor began operations with horizontal snake holes and blasting to form a level surface. This allowed a dozer to work its way to the top of the cut to begin excavation. As soon as a bench was formed, the shovel was brought into play.

From this bench level, Mills sank the 3½-inch holes for the 30-foot lifts. The Air Tracs used three sections of 10-foot drill steel to sink the holes.

At the start, the contractor sank the holes in a 7×9-foot pattern but since an ammonium-nitrate mixture was being used as an explosive, secondary breakage was required after blasting. A drop ball reduced the blasted rock for easier handling.

Each Air Trac, using the carbi insert Rok-Bits, averaged 400 to linear feet of blast hole per 9-h day. Each bit was used for abo 4,000 to 5,000 linear feet of hole this soft limestone formation bef it had to be resharpened. Bits w reground only once before they w disposed of.

Pattern tightened

Mills then tried a 7×8-foot pattern, and the excellent results tained made it unnecessary to the drop ball. The tighter spac made for good breakage with the monium-nitrate explosive, which not as powerful as standard dyna charges.

The 30-foot-deep blast holes w loaded alternately with Atlas 60 cent dynamite and the ammoni nitrate mixture. This mixture w formed by adding about a gallo diesel fuel to an 80-pound bag ammonium nitrate supplied by At The fuel was dumped into a bag ammonium nitrate, and the com nation was mixed in a wheelbarr and shoveled into the blast hole in foot lifts. Between these lifts, a 3 inch half stick of Atlas 60 per c dynamite was placed. Only the b stick at the base of the blast hole capped to act as a primer for ammonium nitrate.

The intermediate half sticks w used to assure even breakage for entire depth of the lift. This load of dynamite and ammonium nitr was carried up to a point 12 feet fr the top of the blast holes. Elec blasting caps, activated by a bla generating set, were used to de nate the charge. Up to 9 millisec delays were used per blast to cont direction. Generally, the contrac shot from the ditch line to the cen of the roadway. The delays also p vided protection for the side w of the cut, and for the back face the cut where additional drilling to be done.

Another reason for the use of lays was the close proximity Frankfort and its surrounding bu up areas. Delays not only control

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Euclid rear-dump unloads rock near edge of a fill; a Cat D8 tractor-dozer ches the material into place. This op- tion permits fines to fill voids in the derlying lift. In the background is the vel and drill spread.

rection of the blast but substan- ly reduce shock wave.

The contractor averaged about one ic yard of blasted rock for every pound of dynamite and ammonium rate.

Hauling rock

fills used four Euclid 15-ton rear- mps to haul about 2,500 cubic yards blasted rock per 9-hour day. The r-dumps dropped their loads st 15 to 20 feet from the edge of fill, and a Cat D8 tractor-dozer shed material over the edge as fill was built up. In this way, the ds within the underlying rock lift re filled with the fines from the terial being pushed.

Rock fill was placed in maximum rs of 3 feet, but the dumping- reading procedure resulted in a ong and tight base.

Waste to borrow

The contractor used about 28,000 ic yards of proposed waste-rock cavation to fill in an area where row material was to be placed. ce the average free-haul distance 2,000 feet and the 28,000 yards rock excavation was 4,000 feet the fill area, only half of this ance was paid as overhaul.

The highway department agreed pay the overhaul as long as it did exceed the price determined for borrow, and the offer was ac- ted by the contractor. This elimi- ed borrow and waste and also pro- d a better and stronger base for roadway than would otherwise e been the case.

The completed road, connecting 80 and Kentucky 35, has two 24- asphaltic-concrete roadways rated by a 4-foot concrete me- n strip and flanked by 10-foot el outside shoulders.

Personnel

M. Lipscomb was the project ger and W. A. Ferguson, the ct superintendent for Ralph E. Co. J. A. Wells was resident en- er for the Kentucky Department ighways.

THE END

Advantages of prestressed concrete shown in film

■ A 20-minute sound and color film, illustrating the ease of manufacture and the many in-use advantages of prestressed concrete in the building industry, is now available from The Colorado Fuel & Iron Corp. for showings to contractors, architects, engineers, government agencies, and schools.

Entitled "Building with Prestressed Concrete," the film shows how the use of prestressed-concrete strand in concrete building materials increases strength and rigidity, while providing for more efficient manufacture of such materials either at the fabricating plant or the construction site.

The film also shows the many other advantages of prestressed concrete, including its adaptability, safety, and "finished" look in single and multi-level buildings, bridges, and highway overpasses.

Prints of the 16-mm film may be obtained by writing to company headquarters, P. O. Box 1920, Denver, Colo., or to the film distributor, Barbre Studios, 2130 S. Bellaire St., Denver 22. An illustrated booklet is also available upon request.

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For more information on the use of Atlas White portland cements in highway and street construction, write Universal Atlas, 100 Park Ave., New York 17, N. Y.

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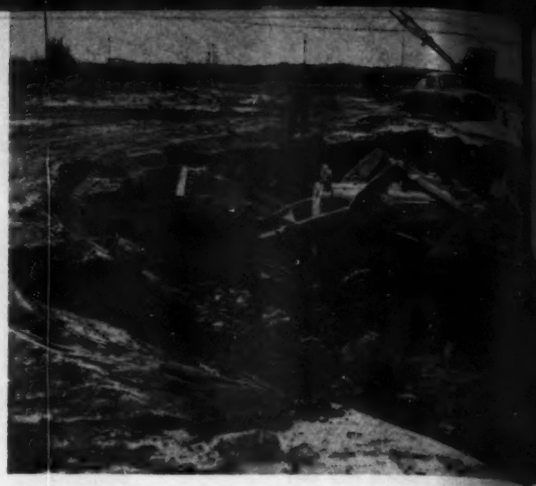
For more facts, use Request Card at page 18 and circle No. 455

Construction Camera

A new showcase—the Metropolitan Fair and Exposition Center—is going up in Chicago. On the upper level of the 2-level, 1,080×340-foot structure a workman uses a board to guide the pumped mix into place for the pan-type slab, which is being reinforced with welded-wire fabric.



Clay fill—some 150,000 yards of it—is being obtained from this clay [illegible] for the new Simmons Co. mattress factory near Munster, Ind. [illegible] Trucking Co., Gary, is using an International Drott 4-in-1 to load the dump trucks making the 2-mile round-trip haul.

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Boothe Leasing, Deere join in lease plan

■ Boothe Leasing Corp., San Francisco, and Deere & Co., Moline, Ill., have worked out a nation-wide plan that will permit customers to lease John Deere Industrial tractors and equipment. The plan will operate through the Deere dealer organization.

Customers, who qualify and who find that leasing will best fit their business financing, will select the tractors and working equipment they want. The dealers will then make arrangements for the purchase of the goods by Boothe and the leasing of them to the customer for 3 to 5-year periods. The dealer will continue to carry out normal service and warranty operations.

The company has eastern headquarters in New York City; branch offices are in Chicago, Cleveland, and Los Angeles, and representatives of the organization are located in Boston, Akron, Denver, Atlanta, and in Wausau, Wis.

PCA promotes two; creates paving bureau

■ Ivan L. Tyler has been appointed research counselor in the Research and Development Division of the Portland Cement Association. He also continues as secretary of the advisory committee to the long-time study of cement performance in concrete.

Paul Klieger is the new manager of the field research section of the organization, succeeding Tyler.

The PCA's highway and municipal and soil-cement bureaus have merged into a single paving bureau, with Gordon K. Ray as manager. The new bureau will be responsible for providing engineering service and developing technical and promotional information on both concrete and soil-cement pavement.

Paving group elects

■ James E. Ward has been elected president of the Association of Asphalt Paving Technologists. He is a bituminous-paving engineer for Barber-Greene Co., Aurora, Ill. The slate of officers also includes first vice president James Rice; second vice president Frank Williams; and secretary-treasurer Ward Paar. J. Rogers Martin and Ray Bollen were named directors at large.

Martin Engineers buys

■ F. Ray Martin Engineers, Inc., has purchased the assets of C. E. Smith & Co., civil engineers. Both firms are in St. Louis. Some of the personnel of the Smith company will join the Martin organization.

Gibbs & Hill appoints

■ W. R. Barrows has joined the staff of Gibbs & Hill, Inc., consulting engineering firm of New York City, as chief hydraulic engineer. He is a fellow of the American Society of Civil Engineers and a registered professional engineer in Tennessee, Oregon, Wisconsin, and Minnesota.

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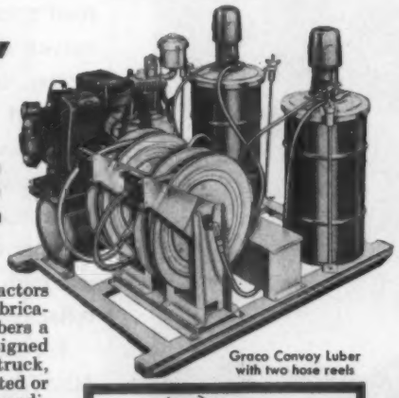

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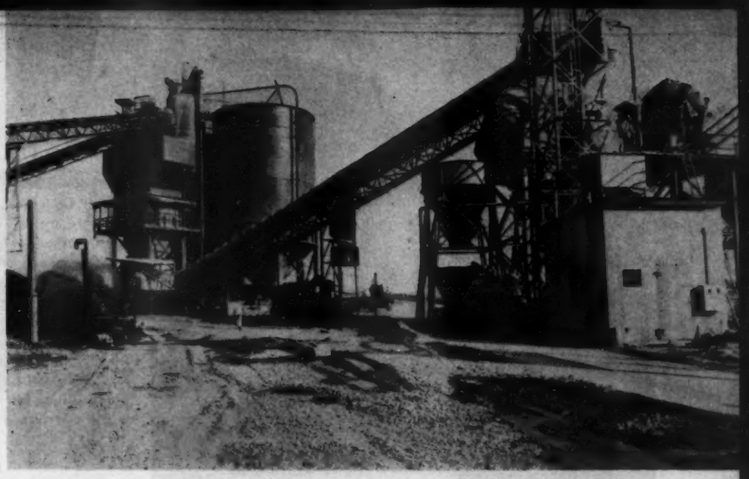
Five cuts through limestone weighing 2,800 pounds per yard are being made for the road connecting Frankfort, Ky., with a 4-lane highway. The 15-ton "Euc" is one in a fleet of five serviced with Gulf No. 2 diesel fuel by contractor Ralph E. Mills Co., Inc., Frankfort. Cuts on the project are 104 and 135 feet deep.



Concrete production for the 500,000-cubic-yard runway and taxiway construction of Chantilly International Airport, Washington, D. C., is handled by this Noble central-mix batching plant. Materials are distributed alternately to three 10-yard tilting mixers for 3-minute mixing and 30-second discharge to Dumpcretes.

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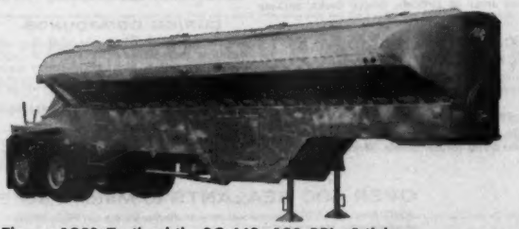

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Highway engineering covers all phases of subject in book

■ The second edition of "Highway Engineering," by Leo J. Ritter and Radnor J. Paquette, offers an up-to-date, coordinated treatment of all phases of highway engineering. Arranged in logical sequence it proceeds from the general to the particular and examines major factors in the order in which they would be encountered in the development of a highway or a highway system.

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The book contains highway cost-benefit calculations, reflecting the work of the American Association of State Highway Officials. Material on geometric design is brought into line with current AASHO policies and the standards for the Interstate System. It shows the effects of the Federal Highway Act of 1956 and subsequent developments, such as the construction starts on the national system of interstate and defense highways. Latest information on highway soil engineering is included, along with the unified soil classification system used by the U. S. Army Corps of Engineers and the Bureau of Reclamation.

Also contained is current data on hydraulic design of open channels and culverts; the use of aerial photogrammetry and electronic computers in surveys and plans; asphalt emulsions, soil aggregate and crushed-stone bases and surfaces; bituminous surface treatments and slurry seal coats; hot-mix bituminous design methods and Marshall and Hveem design methods; and joints and distribution steel reinforcing in portland-cement concrete pavements.

The book is designed for the professional engineer or as a basic textbook for junior, senior, or graduate civil engineering students.

The 739-page book contains 319 illustrations and tables. It costs $10 and may be purchased from the Ronald Press Co., 15 E. 26th St., New York 10, N. Y.

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Bros Inc., Minneapolis, Minn., has signed an agreement with Tutt-Bryant Ltd., allowing the latter company to manufacture the Bros line of compaction and soil-stabilization machinery in Australia.

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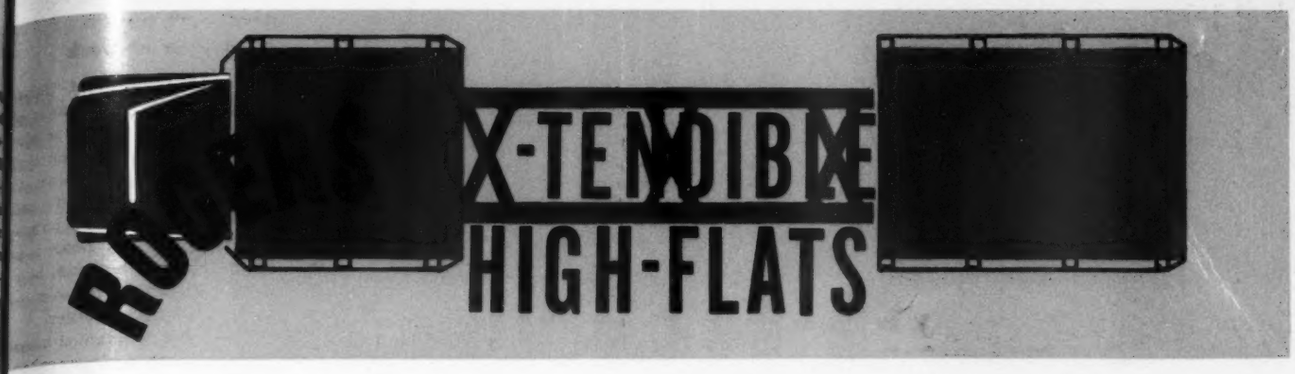

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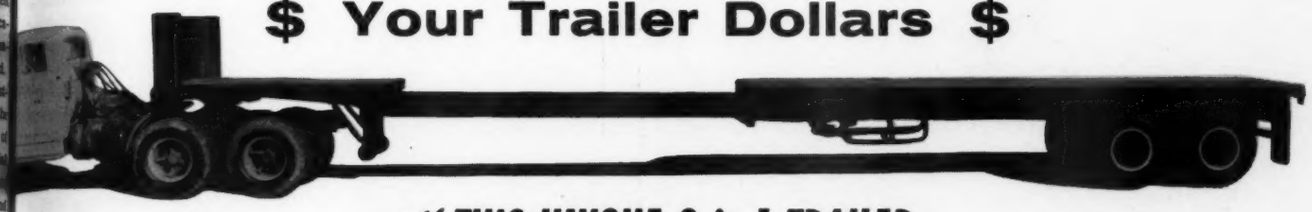

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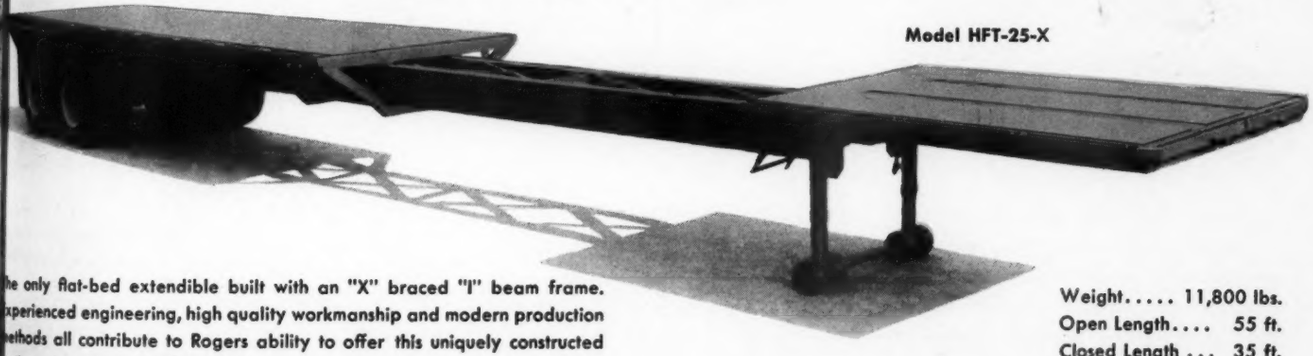

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How Howard W. Thomas Corporation licked the problem of operator inexperience

and boosted production 77%

Like you're doing right now, Mr. Howard Thomas of East Bradenton, Florida, was reading a job story. A job story which told, among other things, how Michigan Tractor Scrapers packed in more pay yards than comparable machines. Also, how their all-Clark power trains, with power shift transmission and torque converter, were producing higher average haul speeds.

Sounded worth checking, thought contractor Thomas. He did—and the result was the purchase of not only a 262 hp, 19 yard Model 210 Scraper, but also a matching (same power, same basic power train) Model 280 Michigan *Tractor Dozer!*

The story of course doesn't end here. The next step was a series of jobs, ranging from the 60,000 yd state road subcontract pictured to a 700,000, yd housing project. Then, one day, a leading competitor of ours brought in a set of platform scales.

What they found sent them away shaking their heads.

For, the Michigan Model 210, weighed and timed over a lengthy period of time, had moved 77% *more dirt per day than its rivals!*

1/3 more pay yds per load

Weight studies showed a 33% advantage. Michigan loads in typical Florida sand *averaged 14 pay yds.* Self-propelled Scrapers "A" and "B," with heaped capacities of 17 yds (compared to the Michigan's 19), each *averaged 10½ pay yds.* Same material, same cut, same pusher (the Michigan 280), *same load time* for all scrapers.

1/3 more trips per hour

Haul studies showed a similar advantage. Traveling over a hilly, winding mile-long round trip, the Michigan made 10 cycles per hour. The other two scrapers each made 7 cycles per hour. Higher top speed (31.4 mph)—plus the exceptional time-saving advantages of power-shift transmission and torque converter—accounted for the difference.

$4.50 per hour profit drain also eliminated

Track replacement alone on his 40,000 lb crawler-pusher used to cost Thomas an average of $4.50 per hour. Downtime was high too: every 500 to 600 hours, the crawler had to be pulled off the job and some 12 man-days invested in a track overhaul. Costly, to say the least.

Today, no more problem! Bigger, more powerful, faster on both pushing and dozing, the 50,000 lb Michigan regularly heap-loads 14 pay yds of sand in 30 to 60 seconds. Tires, now at the 2500 hour mark, still have almost all tread, are expected by company officials to last about three more years.

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